

VELS

INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)
(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)
PALLAVARAM, THALAMBUR, PERIYAPALAYAM, THIRUVANMIYUR - CHENNAI



UNDER GRADUATE DEGREE PROGRAMME

B. C.A Data Science
Three Years
/
B.C.A (Hons) Data Science
Four Years

CURRICULUM & SYLLABUS

REGULATIONS 2026

Effective from the Academic Year
2026-2027

Department of Applied Computing & Emerging Technologies

School of Computing Sciences







VISION OF THE INSTITUTION
To make the Institute an epitome of excellence in higher education by effectively providing high quality education and rigorous training to students in multiple streams of choice with ample scope for all round development to make them excel in their profession for betterment of the society.

MISSION OF THE INSTITUTION	
M1	Effectively imparting knowledge and inculcating innovative thinking.
M2	Facilitating skill enhancement through add on courses and hands on training.
M3	Doing original, socially relevant, high-quality research.
M4	Instilling the spirit of integrity, equity, professional ethics and social harmony.







DEPARTMENT OF APPLIED COMPUTING & EMERGING TECHNOLOGIES

VISION OF THE DEPARTMENT
To nurture highly skilled, innovative, and ethically responsible computing professionals with strong analytical, computational, and problem-solving capabilities in Data Science, Cloud Computing, and emerging technologies, enabling them to contribute effectively to global industry, research,entrepreneurship, and sustainable societal development in the rapidly evolving digital era.

MISSION OF THE DEPARTMENT	
M1	Deliver high-quality, industry-relevant education in Applied Computing, Data Science, Cloud Computing, and emerging technologies through innovative pedagogy, experiential learning, and outcome-based education.
M2	Promote research, innovation, entrepreneurship, and interdisciplinary collaboration through advanced laboratories, Centres of Excellence, industry engagement, and global academic partnerships.
M3	Develop globally competent computing professionals equipped with analytical thinking, computational expertise, leadership, communication, and problem-solving skills to address contemporary technological and societal challenges.
M4	Foster professional ethics, social responsibility, sustainable practices, and lifelong learning, empowering graduates to contribue effectively to industry, research, and national development in the digital era.

PROGRAMME EDUCATIONAL OUTCOMES (PEO)	
PEO1	Graduates will establish successful careers in Data Science, Analytics, Artificial Intelligence, Software Development, and related computing domains by applying strong foundations in programming, statistics, data management, and intelligent technologies.
PEO2	Graduates will effectively analyse complex data, develop data-driven solutions, and utilize modern analytical tools and emerging technologies to address real-world business, industrial, and societal challenges.
PEO3	Graduates will possess professional, leadership, communication, and collaborative skills required to excel in global industries, higher education, research, and multidisciplinary professional environments.
PEO4	Graduates will pursue higher education, professional certifications, research, entrepreneurship, and lifelong learning to adapt to evolving technologies and advance their careers in Data Science and related fields.

PROGRAMME OUTCOMES (PO)	
PO1	**Computational Knowledge:** Apply knowledge in computing, mathematics, data science, cloud computing, and emerging technologies to solve real-world problems effectively.
PO2	**Problem Analysis:** Identify, analyze, and solve computing and data-driven problems using logical thinking and analytical skills to develop innovative solutions.
PO3	**Design and Development of Solutions:** Design, develop, test, and implement software systems,cloud-based applications, and data-driven solutions for industrial and societal needs.
PO4	**Modern Tool Usage:** Use modern computing tools, programming frameworks, cloud platforms, AI technologies, and data analytics tools for effective solution development.
PO5	**Research, Innovation, and Entrepreneurship:** Demonstrate creativity, innovation, research skills, and entrepreneurial abilities in developing technology-based solutions and products.
PO6	**Professionalism, Ethics, and Society:** Apply ethical values, cyber ethics, professional integrity, and social responsibility in computing practices and technology usage.
PO7	**Environment and Sustainability:** Understand the impact of computing technologies on society and environment and adopt sustainable and ethical computing practices.
PO8	**Communication, Leadership, and Teamwork:** Demonstrate effective

	communication, leadership, interpersonal, and teamwork skills in multidisciplinary and professional environments.
PO9	**Lifelong Learning :** Engage in continuous learning, professional development, and adaptability to emerging technologies and global industrial trends.

PROGRAMME SPECIFIC OUTCOMES (PSO)	
PSO1	Acquire, manage, process, and analyze structured and unstructured data using statistical and analytical tools and techniques to identify patterns, trends, and actionable insights for real-world problem solving.
PSO2	Develop predictive and intelligent models by applying machine learning, artificial intelligence, and data mining techniques to address business, scientific, and societal challenges.
PSO3	Design and implement data-driven applications with effective data visualization and decision-support capabilities across diverse domains such as healthcare, finance, education, business, and smart systems.

ABBREVIATIONS

PCC	PROGRAMME CORE COURSE
AEC	ABILITY ENHANCEMENT COURSE
PEC	PROFESSIONAL ELECTIVE COURSE
MDC	MULTI -DISCIPLINARY CORE COURSE
VAC	VALUE ADDED COURSE
SEC	SKILL ENHANCEMENT COURSE
PRD	PROJECT REPORT DISSERTATION
SI	SUMMER INTERNSHIP

CURRICULUM STURUCTURE

B.C.A Data Science / B.C.A (Hons) Data Science Four Years

Total number of Credits: 176

	B.C.A (Hons) Data Science(4 Years) Minimum Credits to be earned :176 B.C.A Data Science(3 Years) Minimum Credits to be earned: 132									
	SEMESTER 1									
			Hours/Week				C	Marks Maximum		
Category	Code	Course	L	T	P	SL		CIA	SEE	Total
AEC	26LTAM11/ 26LHIN11/ 26LFRE11/ 26LISB11	Tamil I/ Hindi I/ French I/ Indian Sign Language-I(Basic)	3	0	0	3	3	40	60	100
AEC	26LENG11	English I	3	0	0	3	3	40	60	100
PCC	26CBDS11	Fundamentals of Data Science	3	0	0	3	3	40	60	100
PCC	26CBDS12	Digital Logics and Circuit Design	3	0	0	3	3	40	60	100
PCC	26CBDS13	Problem Solving and Programming	3	0	0	3	3	40	60	100
MDC	26BMA001	Mathematics-I	3	0	0	3	3	40	60	100
PCC (Lab)	26PBDS11	Problem Solving and Programming Lab	0	0	2	2	1	40	60	100
PCC (Lab)	26PBDS12	Data Analytics using Spreadsheet	0	0	2	2	1	40	60	100
VAC	26BVAC13	Environmental Studies and Sustainability	2	0	0	2	2	40	60	100
VAC	26BVAC11	Indian Knowledge System	2	0	0	2	2	40	60	100
			22	0	4		24	-	-	-

CIA - Continuous Internal Assessment SEE - Semester End Examination

L – Lecture, T- Tutorial, P- Practical, SL – Self – Learning, C-Credit

			Hours/Week					Maximum Marks		
Category	**Code**	**Course**	**L**	**T**	**P**	**SL**	**C**	**CIA**	**SEE**	**Total**
AEC	26LTAM21/ 26LHIN21/ 26LFRE21/ 26LISB21	Tamil-II / Hindi-II / French-II/ Indian Sign Language-II(Advanced)	3	0	0	3	3	40	60	100
AEC	26LENG21	English-II	3	0	0	3	3	40	60	100
PCC	26CBDS21	Relational Database Management System	3	0	0	3	3	40	60	100
PCC	26CBDS22	Data Structures and Algorithms	3	0	0	3	3	40	60	100
PCC	26CBDS23	Python for Data Science	3	0	0	3	3	40	60	100
MDC	26BMA002	Mathematics-II	3	0	0	3	3	40	60	100
PCC (Lab)	26PBDS21	Relational Database Management System Lab	0	0	2	2	1	40	60	100
PCC (Lab)	26PBDS22	Data Structures Using Python Lab	0	0	2	2	1	40	60	100
VAC	26DVAC21	Universal Human Values	1	0	0	1	1	40	60	100
AEC	26PSSK12	Communication Skills	0	0	4	4	2	-	100	100
			19	**-**	**8**		**23**	**-**	**-**	**-**

CIA - Continuous Internal Assessment **SEE - Semester End Examination**

L – Lecture, T- Tutorial, P- Practical, SL – Self – Learning, ,C-Credit

SEMESTER 3										
			Hours/Week				C	Maximum Marks		
Category		Course	L	T	P	SL		CIA	SEE	Total
PCC		Operating Systems and Shell scripts	3	0	0	3	3	40	60	100
PCC		Software Engineering	3	0	0	3	3	40	60	100
PCC		Web Technologies	3	0	0	3	3	40	60	100
PCC		Object Oriented Programming in Java	3	0	0	3	3	40	60	100
PEC		Data Visualization	2	0	2	4	3	40	60	100
PCC (Lab)		Object Oriented Programming in Java Lab	0	0	2	2	1	40	60	100
PCC (Lab)		Unix Programming Lab	0	0	2	2	1	40	60	100
PCC (Lab)		Web Technologies Lab	0	0	2	2	1	40	60	100
VAC		Disaster Management/NSS/Yoga	0	0	4	4	2	40	60	100
SEC		Professional Development – I	2	0	0	2	2	40	60	100
SEC		Global Certification	-	-	-	1	1	-	-	100
			16	-	12		23	-	-	-

CIA - Continuous Internal Assessment SEE - Semester End Examination

L – Lecture, T- Tutorial, P- Practical, SL – Self – Learning, ,C-Credit

SEMESTER 4

Category	Code	Course	Hours/Week				C	Maximum Marks		
			L	T	P	SL		CIA	SEE	Total
PCC		Computer Networks	3	0	0	3	3	40	60	100
PCC		Artificial Intelligence and Machine Learning	3	0	0	3	3	40	60	100
MDC		Probability and Statistics	3	0	0	3	3	40	60	100
PEC		Data Analytics using R Programming	3	0	0	3	3	40	60	100
PEC		Exploratory Data Analysis	2	0	2	4	3	40	60	100
PCC (Lab)		Artificial Intelligence and Machine Learning Lab	0	0	2	2	1	40	60	100
PEC(Lab)		R Programming Lab	0	0	2	2	1	40	60	100
SEC		Design Thinking and Innovation	2	0	0	2	2	40	60	100
SEC		Professional Development – II	2	0	0	2	2	40	60	100
SEC		Entrepreneurship and Startup Ecosystem	2	0	0	2	2	40	60	100
			20	-	6	-	23	-	-	-

CIA - Continuous Internal Assessment SEE - Semester End Examination

L – Lecture, T- Tutorial, P- Practical, SL – Self – Learning, C-Credit

SEMESTER 5

			Hours/Week				C	Maximum Marks		
Category	Code	Course	L	T	P	SL		CIA	SEE	Total
PEC		Foundation of Neural Networks	4	0	0	4	4	40	60	100
PEC		Time Series Analysis	4	0	0	4	4	40	60	100
PEC		Web Development using MERN	3	0	0	3	3	40	60	100
PEC (Lab)		Neural Networks Lab	0	0	2	2	1	40	60	100
PEC (Lab)		Web Development using MERN lab	0	0	2	2	1	40	60	100
SEC		Professional Development – III	2	0	0	2	2	40	60	100
SEC		Quantitative Techniques	2	0	0	2	2	40	60	100
SI		Internship-I	0	0	8	8	4	-	-	100
			14	-	14	-	21	-	-	

CIA - Continuous Internal Assessment SEE - Semester End Examination

L – Lecture, T- Tutorial, P- Practical, SL – Self – Learning, C-Credit

SEMESTER 6										
			Hours/Week				C	Maximum Marks		
Category	Code	Course	L	T	P	SL		CIA	SEE	Total
PCC		Generative AI	3	0	0	3	3	40	60	100
PEC		Big Data Analytics	3	0	0	3	3	40	60	100
PEC		Deep Learning for NLP	3	0	0	3	3	40	60	100
PCC LAB		Generative AI Lab	0	0	2	2	1	40	60	100
PEC LAB		Deep Learning for NLP Lab	0	0	2	2	1	40	60	100
PEC LAB		Big Data Analytics Lab	0	0	2	2	1	40	60	100
SEC		Apprenticeship/On Job Training	0	0	0	0	1	-	-	100
PRD		Major Project (Initiated in 5th Semester) /Start up initiatives	0	0	0	0	4	-	-	100
			9	-	6	-	17	-	-	

CIA - Continuous Internal Assessment SEE - Semester End Examination
L – Lecture, T- Tutorial, P- Practical, SL – Self – Learning, C-Credit

SEMESTER 7										
			Hours/Week				C	Maximum Marks		
Category	Code	Course	L	T	P	SL		CIA	SEE	Total
PEC		Research Methodology in Data Science	4	0	0	4	4	40	60	100
MDC		Advanced Statistical methods for Data Science	3	0	2	5	4	40	60	100
PEC		Business Intelligence & Analytics	4	0	0	4	4	40	60	100
PEC		Advanced Data Visualization	4	0	0	4	4	40	60	100
PEC (Lab)		Business Intelligence & Analytics Lab	0	0	2	2	1	40	60	100
PEC (Lab)		Advanced Data Visualization Lab	0	0	2	2	1	40	60	100
SI		Summer Internship	0	0	8	8	4	40	60	100
			15	-	14	-	22	-	-	-

CIA - Continuous Internal Assessment SEE - Semester End Examination

L – Lecture, T- Tutorial, P- Practical, SL – Self – Learning, C-Credit

SEMESTER 8										
			Hours/Week				C	Maximum Marks		
Category	Code	Course	L	T	P	SL		CIA	SEE	Total
PEC		Advanced Big data Analysis Tools	4	0	0	4	4	40	60	100
PEC		Cloud Computing for Data Analytics	4	0	0	4	4	40	60	100
PEC Lab		Cloud Computing for Data Analytics Lab	0	0	4	4	2	40	60	100
PEC		Data Security & Privacy	4	0	0	4	4	40	60	100
PRD		Project Report Dissertation work (started in Seventh Semester	0	0	16	16	8	40	60	100
			10	-	20	-	22			

CIA - Continuous Internal Assessment SEE - Semester End Examination

L – Lecture, T- Tutorial, P- Practical, SL – Self – Learning, C-Credit

PROGRAMME CORE COURSES (PCC)

SEMESTER	COURSE NAME
I	Fundamentals of Data Science
	Digital Logics & Circuit Design
	Data Analytics using Spreadsheet (LAB)
II	Relational Database Management Systems
	Data Structures & Algorithms
	Python for Data Science
	Data Structures using Python Lab
	Relational Database Management Lab
III	Operating Systems & Shell scripts
	Software Engineering
	Web Technologies
	Object Oriented Programming in Java
	Object Oriented Programming in Java Lab
	Web Technologies Lab
	Unix Programming Lab
IV	Computer Networks
	Artificial Intelligence & Machine Learning
	Artificial Intelligence & Machine Learning Lab
VI	Generative AI
	Generative AI Lab
VII	Research Methodology in Data Science
VIII	Advanced Big data Analysis Tools

PROFESSIONAL ELECTIVE COURSES (PEC)

SEMESTER	COURSE NAME
III	Data Visualization
IV	Data Analytics using R Programming
	R Programming Lab
	Exploratory Data Analysis
V	Foundation of Neural Networks
	Neural Networks Lab
	Time Series Analysis
	Web Development using MERN
	Web Development using MERN Lab
VI	Big Data Analytics
	Big Data Analytics Lab
	Deep Learning for NLP
	Deep Learning for NLP Lab
VII	Business Intelligence & Analytics
	Advanced Data Visualization
	Business Intelligence & Analytics Lab
	Advanced Data Visualization Lab
VIII	Cloud Computing for Data Analytics
	Data Security & Privacy

MULTI-DISCIPLINARY CORE COURSES

SEMESTER	COURSE NAME
I	Mathematics-I
II	Mathematics-II
IV	Statistics-IV

VALUE ADDED COURSES (VAC)

SEMESTER	COURSE NAME
I	Environmental Studies & Sustainability
II	Universal Human Values
III	Disaster Management/NSS/Yoga

ABILITY ENHANCEMENT COURSES (AEC)

SEMESTER	COURSE NAME
I	Tamil-I / Hindi-I/ French-I
I	English-I
II	Tamil-II / Hindi-II / French-II
II	English-II
II	Communication Skills

SKILL ENHANCEMENT COURSES (SEC)

SEMESTER	COURSE NAME
I	Problem Solving and Programming
	Problem Solving and Programming Lab
III	Professional Development I
	Global Certification IBM /Nasscom /Udemy/ /Coursera/
IV	Design Thinking and Innovation
	Professional Development II
	Entrepreneurship and Startup Ecosystem
V	Quantitative Techniques
	Professional Development III
VI	Apprenticeship/On Job Training

SUMMER INTERNSHIP (SI)

SEMESTER	COURSE NAME
V	Summer Internship/Capstone Project
VII	Summer Internship

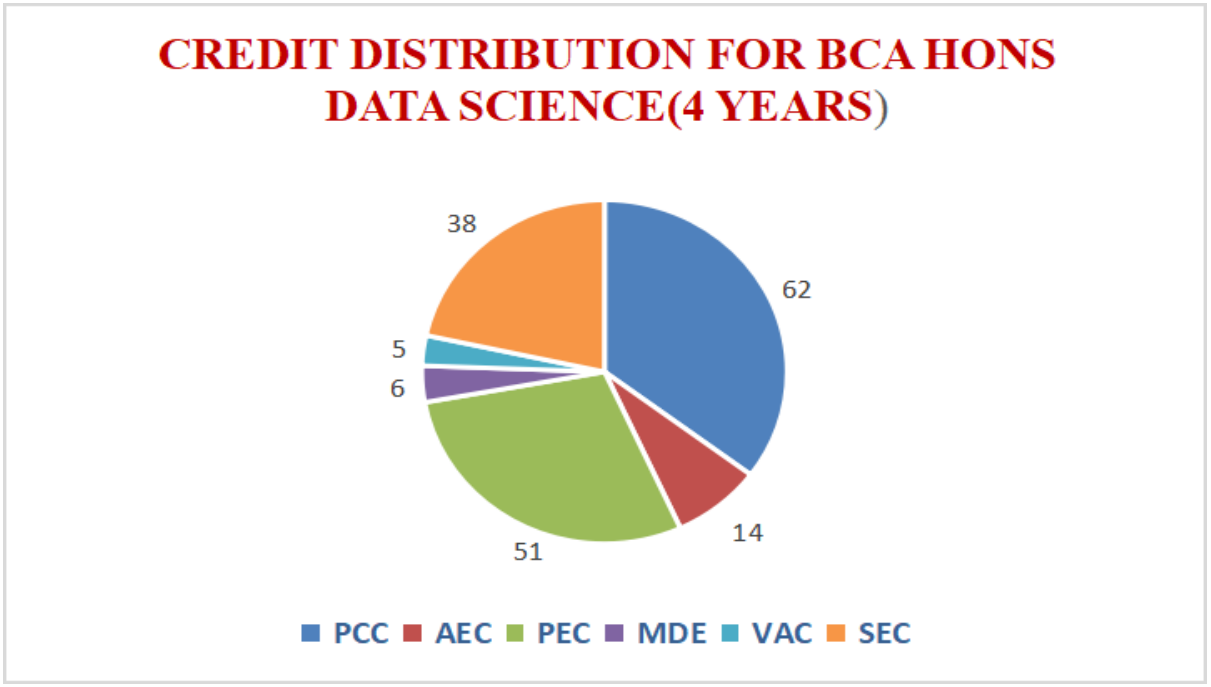
PROJECT REPORT DISSERTATION (PRD)

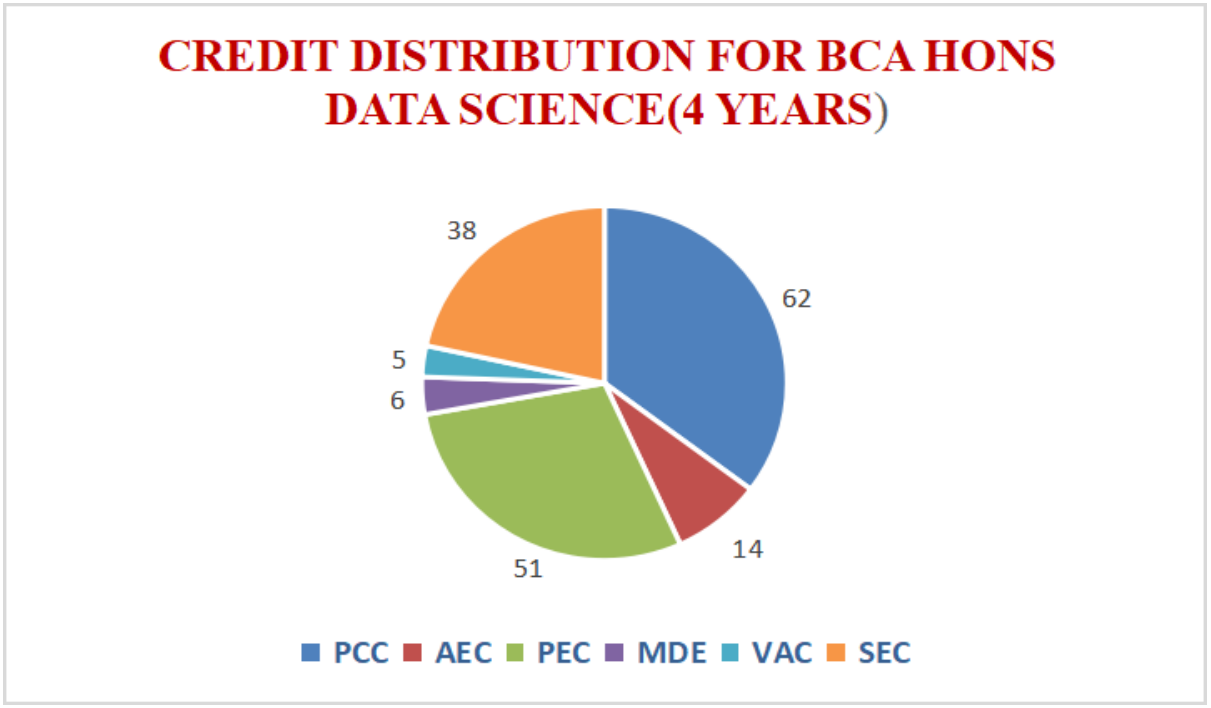
SEMESTER	COURSE NAME
V	Project Report Dissertation (Evaluation in Sixth Semester)
VI	Major Project Report Dissertation (Initiated in 5th Semester) /Start up initiatives
VIII	Project Report Dissertation (started in Seventh Semester

CREDIT DISTRIBUTION

COMPONENTS	I SEM	II SEM	III SEM	IV SEM	V SEM	VI SEM	3 Yrs. Total Credits	VII SEM	VIII SEM	4 Yrs Total Credits
PROGRAMME CORE COURSE(PCC)	10	14	11	15		4	54	4	4	62
ABILITY ENHANCEMENT COURSE(AEC)	6	8	-	-	-	-	14	-	-	14
PROGRAMME ELECTIVE COURSE (PEC)	-	-	3	7	13	8	31	10	10	51
MULTI - DISCIPLINARY ELECTIVE(MDE)	2	-	-	-	-	-	2	4	-	6
VALUE ADDED COURSE (VAC)	2	1	2		-	-	5	-	-	5
SKILL ENHANCEMENT COURSE(SEC)	4		7	2	8	5	26	4	8	38
TOTAL CREDIT	24	23	23	24	21	17	132	22	22	176

CHART FOR CREDIT DISTRIBUTION





26LTAM11	TAMIL-I	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

மாணவர்களின் தமிழ்மொழித் திறத்தை மேம்படுத்துதல், சங்க இலக்கிய நாட்டத்தை மேம்படுத்துதல், நீதி இலக்கியங்கள் வழி அறக் கருத்துகளை இன்றைய தலைமுறையினர் அறியச் செய்தல், இலக்கிய வடிவங்களான உரைநடை சிறுகதை ஆகியவற்றின் சமூக நிலை குறித்து அறியச் செய்தல், மாணவர்களுக்குத் தமிழைத் தவறின்றி எழுதுவதற்குத் தேவையான பயிற்சி அளித்து அவர்களின் மொழித்திறனை மேம்படுத்துதல், கலைச்சொற்கள் போன்ற தமிழ் மொழியின் வளர் நிலைகளை அறிமுகம் செய்தல் போன்றன இந்தப் பாடத்திட்டத்தின் முக்கிய நோக்கமாகும்.

UNIT I	**அலகு- 1: தமிழ் மொழி வரலாறு**	**10 Hours**

அலகு- 1: தமிழ் மொழி வரலாறு

மொழிக்குடும்பம் - இந்திய மொழிக்குடும்பங்கள் - இந்திய ஆட்சி மொழிகள் - திராவிட மொழிக்குடும்பங்கள் - திராவிட மொழிகளின் வகைகள் –திராவிட மொழிகளின் சிறப்புகள் - திராவிட மொழிகளின் வழங்கிடங்கள் - திராவிட மொழிகளுள் தமிழின் இடம் - தமிழ்மொழியின் சிறப்புகள் - தமிழ் பிறமொழித் தொடர்புகள்.

UNIT II	**அலகு- 2: சங்க இலக்கியங்கள்**	**9 Hours**

புறநானூறு- பாடல் எண்: 195 (பல்சான்றீரே) 192 (யாதும் ஊரே) 188 (படைப்பு பல) குறுந்தொகை- பாடல் எண்: 03 (நிலத்தினும்) 131 (ஆடமை புரையும்) 57(பூவிடைப்படினும்) 202 (நோம் என் நெஞ்சே) 167 (முளிதயிர்) நெடுநல்வாடை: பாடல் வரிகள் 45 முதல் 72 வரை

UNIT III	**அலகு - 3 அற இலக்கியங்கள்**	**9 Hours**

திருக்குறள் அறன் வலியுறுத்தல் (அறம்), நட்பாராய்தல் (பொருள்), குறிப்பறிதல்(இன்பம்),. மூன்று அதிகாரங்கள் முழுமையும் நாலடியார் - பாடல் எண்: 139 (கல்லாரே ஆயினும்) 248 (நண்ணிலைக்கான்) 216 (கடையாயர்) ஔவையார் - மூதுரை- பாடல் எண்- 10 (நெல்லுக்கு இறைத்தநீர்), - பாடல் எண்- 16 (அடக்கமுடையார்)

UNIT IV	**அலகு - 4 உரைநடை**	**9 Hours**

சிற்பியே உன்னைச் செதுக்குகிறேன் - வைரமுத்து - லட்சியம்,கல்வி, கலை, உறவு, மொழி,சாதனை ஆகிய தலைப்பிலான கட்டுரைகள்

சிறுகதை புதுமைப்பித்தன் – சாபவிமோசனம் ஜெயகாந்தன் - ஒரு பிடி சோறு

UNIT V	**அலகு 5 மொழித்திறன்**	**8 Hours**

பிழை நீக்கி எழுதுதல் - ஒற்றுப்பிழை நீக்கி எழுதுதல் - தொடர்பிழை நீக்கி எழுதுதல் கலைச்சொல்லாக்கம் - தேவைகள் - கலைச்சொற்களின் பண்புகள் அறிவியல் கலைச்சொற்கள். கடிதம் - வகைகள் - அலுவலகக் கடிதங்கள் - பயிற்சி

Total: 45 Hours

Self-Learning: 45 Hours

பார்வை நூல்கள்

1. திராவிட மொழிகள் (இரண்டு தொகுதிகள்) டாக்டர் ச.அகத்தியலிங்கம் மணிவாசகர் பதிப்பகம் 2021

2. சங்க இலக்கிய உரை என் சி பி எச் சென்னை 2010

3. திருக்குறள் தெளிவுரை வரதராசன், மு., கழக வெளியீடு, 1994.

4. தவறின்றித் தமிழ் எழுத - மருதூர் அரங்கராசன், ஐந்திணைப் பதிப்பகம், 2003.

5. சிற்பியே உன்னை செதுக்குகிறேன் வைரமுத்து சூர்யா லிட்ரேச்சர் சென்னை 2011

6. பாடநூல் தேடலுக்கான இணையம் - https://archive.org/

7. https://tamildigitallibrary.in/Articles/

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Appreciate and interpret the aesthetic values and literary excellence embedded in Sangam literature.	K2
CO2	Analyze and apply the ethical and moral principles presented in classical Tamil literature to contemporary life situations.	K3
CO3	Examine the evolution, social relevance, and narrative techniques of Tamil prose, short stories, and related literary forms.	K4
CO4	Evaluate proficiency in Tamil language skills including listening, speaking, reading, and writing.	K5
CO5	Identify the historical development of the Tamil language and the formation of technical terminology in Tamil.	K1

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	2	–	2	–	2	3	2	–	–	–	2
CO2	3	–	2	–	2	3	2	–	–	–	2
CO3	3	–	2	–	2	3	2	–	–	-	2
CO4	2	–	2	–	2	2	2	-	-	-	3
CO5	2	–	2	–	2	3	2	–	–	-	2
AVG	2.0	1.2	-	-	2.6	2.8	2.2	-	-	-	2.4

26LHIN11	HINDI-I	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To improve students' proficiency in the Hindi language, to increase their interest in prose literature,
- To make the present generation aware of moral values, social limits through various genre of Hindi prose
- To improve students' language proficiency by giving them the necessary training to write error-free correspondence, and to familiarize them with technical terminology and updated language technology.

UNIT I		9 Hours

इकाई/UNIT I : हिन्दी साहित्य का इतिहास - काल विभाजन - गद्य विकास -सामान्य परिचय, कहानी - लॉटेरी (मुंशी प्रेमचंद), भाव एक, भाषा अनेक (देश भक्ति और राष्ट्रीय एकता) - विभिन्न भारतीय संस्कृति एवं प्रदेशों के परिचय History of Hindi Literature – Periodization – Development of Prose – General Introduction, Short Story – "Lottery" (Munshi Premchand), "One Emotion, Many Languages" (Patriotism and National Integration) – Introduction to various Indian cultures and regions.

UNIT II		9 Hours

इकाई/UNIT II : एकाँकी - अखबारी विज्ञापन (चिरंजीत) - भाषा कौशल विकास -प्रयोजनमूलक हिन्दी - तकनीकी शब्द, पद एवं विभागीय नाम, प्रशासनिक वाक्यांश One-Act Play – "Newspaper Advertisement" (Chiranjit) – Development of Language Skills – Functional Hindi – Technical Terms, Designations and Departmental Names, Administrative Phrases

UNIT III		9 Hours

इकाई/UNIT III: हास्य व्यंग्य कहानी - तुम कब जाओगे, अतिथि (शरद जोशी) - प्रयोजनमूलक हिन्दी - पत्र लेखन - पत्रों के विभिन्न प्रकार - औपचारिक पत्र Humorous Satirical Story – "Tum Kab Jaoge, Atithi" (Sharad Joshi) – Functional Hindi – Letter Writing – Different Types of Letters – Formal Letters.

UNIT IV		9 Hours

इकाई/UNIT IV: राष्ट्र भक्ति कहानी - पुरस्कार (जयशंकर प्रसाद) – प्रयोजनमूलक हिन्दी - पत्र लेखन- पत्रों के विभिन्न प्रकार - अनौपचारिक पत्र Patriotic Story – "Puraskaar" (Jaishankar Prasad) – Functional Hindi – Letter Writing – Different Types of Letters – Informal Letters.

UNIT V		9 Hours

इकाई/UNIT V : निबंध: भारतीय विज्ञान की कहानी (गुणाकार मुले) - विश्व के लिए भारत की देन, प्रयोजनमूलक हिन्दी - भाषा प्रौद्योगिकी – युनिकोड हिन्दी फ़ॉन्ट्स,इनस्क्रिप्ट कीबोर्ड - ई-पुस्तकालय – ई-शब्दकोश – ई-अध्ययन – व्यावहारिक उपयोग हेतु कृत्रिम बुद्धिमत्ता Essay: "The Story of Indian Science" (Gunakar Mule) – India's Contribution to the World – Functional Hindi – Language Technology – Unicode Hindi Fonts, Inscript Keyboard – e-Library – e-Dictionary – e-Learning – Artificial Intelligence for Practical Use

Total: 45 Hours

Self-Learning: 45 Hours

संदर्भ ग्रन्थ/ Reference Books

1. Munshi Premchand: Mansarovar (Short Story Collection), Vol. 8 Hans Prakashan / Saraswati Press / Prabhat Prakashan (various editions available)

2. Vyavaharik Hindi, Publisher: Rajpal & Sons, New Delhi

3. One-Act Play Collection, Lokbharti Prakashan, Prayagraj

4. Prayojanmoolak Hindi, Dr. Naresh Mishra / Dr. Kailash Chandra Bhatia,Rajkamal Prakashan / Vani Prakashan

5. Sharad Joshi Vyangya Rachanavali, Vol. 1, Rajkamal Prakashan

6. Prasad Ki Shreshtha Kahaniyan, Lokbharti Prakashan

7. Vyavaharik Hindi Aur Patra Lekhan, Dr. Hardev Bahri, Kitab Mahal, Allahabad

8. Bharatiya Vigyan Ki Kahani – Gunakar Mule, Rajkamal Prakashan

9. Computer Aur Hindi Bhasha, Dr. Bholanath Tiwari, Vani Prakashan

10. Hindi Sahitya Ka Itihas, Ramchandra Shukla, Nagari Pracharini Sabha, Varanasi

11. Kendriya Hindi Sansthan, Banking Hindi Patyakram, 2012.

वेब लिंक्स/ Web Sources:

1. https://www.prabhatbooks.com

2. jhttps://vaniprakashan.com

3. https://www.rajkamalprakashan.com

4. https://home.unicode.org

5. https://home.unicode.org

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Develop interest in Hindi language & literature , various culture of India	K2
CO2	Learn moral values in a lighter way & proficient in functional hindi	K3
CO3	Know the awareness about the social limitations	K2
CO4	Identify the importance of patriotism	K1
CO5	Analyze and produce structured functional Hindi content using modern technology tools.	K4

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	2	2	–	–	2	3	2	-	–	–	2
CO2	2	–	–	–	2	3	2	-	–	–	3
CO3	2	2	–	–	2	3	2	-	–	-	2
CO4	2	–	–	–	2	3	3	-	-	-	2
CO5	2	2	-	-	3	2	2	-	–	-	3
AVG	2.0	1.2	-	-	2.6	2.8	2.2	-	-	-	2.4

26LFRE11	FRENCH–I	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To greet, to express excuse and to introduce oneself
- To introduce another person
- To express his/her ideas, opinions and weekend projects
- To request someone to do something, polite manners
- To accept, refuse, enquire and indicate the time and date
- To express himself / herself in positive and negative manner

UNIT I	Salut	6 Hours
les nombres, Les jours de la semaine et du mois, La nationalité		
UNIT II	**Enchanté**	**8 Hours**
Les verbes Etre, Avoir, Aller, Regular ER verbes, Present tense.		
UNIT III	**J'Adore**	**8 Hours**
La negation, l'adjectif possessif, le futur proche		
UNIT IV	**Tu veux bien**	**10 Hours**
Les articles de finis/indéfinis, Les pronoms après une préposition (avec lui, chez moi), Le passé composé		
UNIT V	**On se voit quand**	**6 Hours**
Les pronoms compléments directs me, te, nous, vous, L'interrogation avec est-ce que, L'heure et la date.		
UNIT VI	**Bonne idée**	**7 Hours**
Les articles partitifs, Le masculin et le féminin des adjectifs, Les pronoms compléments directs le, la, les, La négation : ne… pas de.		

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS :

1. LATITUDES 1 (A1/A2) MÉTHODE DE FRANÇAIS - Régine Mérieux and Yves Loiseau

REFERENCE BOOKS:

1. SAISON A1 - MÉTHODE DE FRANÇAIS - Marie-Noëlle Cocton, Élodie Heu, Catherine Houssa, Émilie Kasazian

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Greet, excuse and introduce oneself in simple communication situations.	K2
CO2	Recall basic expressions used for introducing someone.	K1
CO3	Analyze and express ideas, opinions, and weekend activities in different contexts.	K4
CO4	Ask someone to do tasks in a polite and appropriate manner.	K3
CO5	Accept, refuse, enquire, and indicate time and date in everyday communication.	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	2	–	–	–	2	3	3	2	–	–	2
CO2	3	–	–	–	2	3	3	2	–	–	3
CO3	2	-	-	-	2	3	2	2	–	–	2
CO4	2	–	–	–	2	2	3	2	–	–	2
CO5	2	-	-	-	2	3	3	3	–	–	3
AVG	2.2	-	-	-	2.0	2.8	2.8	2.2	–	–	2.4

26LISB11	INDIAN SIGN LANGUAGE - I (BASIC)	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- Understand Deaf culture and why Indian Sign Language (ISL) is important for making sure everyone has equal rights and can participate in society.
- Learn the basics of everyday conversation so you can talk to hearing-impaired community using sign language.
- Learn how to sign about daily life, such as your routine, what you need, food, people, and how to describe things like Color, shape, and size.
- To bring ISL into everyday places like schools, jobs, and public services to make the world more inclusive.
- Stay motivated to keep practicing and improving your ISL skills so you can support and stand up for the hearing-impaired community.

UNIT I		9 Hours
The Basics: Alphabets (finger-spelling), numbers, weekdays, colors, and how to give wishes.		

UNIT II		9 Hours
People & Food: Months, food items, family members, and different types of behavior.		

UNIT III		9 Hours
Feelings & Festivals: Using expressions, plus signs for fruits, vegetables, and various festivals.		

UNIT IV		9 Hours
Home & Nature: Clothing and cosmetics, things on the earth or in the sky, parts of a house, and animals and birds.		

UNIT V		9 Hours
Society & School: Names of states and cities, religions, education terms, and school items.		

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS :

1. Indian Sign Language Dictionary by Ramakrishna Mission Vidyalaya, IHRDC, Coimbatore

REFERENCE BOOKS:

1. Sign Language in India: A Linguistic Exploration by Dr. Sandeep Sharma Jat .

2. The Indian Sign Language by William P. Clark.

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	**Master the Basics**: Use finger-spelling for the alphabet and communicate numbers, days of the week, and months.	K1
CO2	**Grow Your Vocabulary**: Sign about common foods, family members, clothes, and household items.	K2
CO3	**Talk About Nature:** Identify and sign various animals, birds, fruits, vegetables, and elements like the earth and sky.	K2
CO4	**Socialize:** Give people well wishes, describe different behaviours, and talk about festivals and religions.	K3
CO5	**Navigate Places & Education Field:** Sign the names of specific states and cities, along with words used in education field.	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	-	-	-	-	-	3	-	3	2	-	-
CO2	-	-	-	-	-	3	-	3	2	-	-
CO3	-	-	-	-	-	3	2	3	2	-	-
CO4	-	-	-	-	-	3	-	3	2	-	-
CO5	-	-	-	-	-	3	-	3	2	-	-
Avg	-	-	-	-	-	3	2	3	2	-	-

26LENG11	ENGLISH–I	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To develop an understanding of prose, poetry, and short stories.
- To enhance reading comprehension and critical thinking skills.
- To improve accuracy and clarity in language use.
- To build a rich and adequate vocabulary.
- To promote the use of digital tools for communication and presentation skills.

UNIT I	Grammar & Vocabulary	9 Hours

- Parts of Speech
- Subject – Verb Agreement
- Tenses
- Prefix and Suffix
- Spot the errors

UNIT II	Prose	9 Hours

- A.G. Gardiner – *On the Rule of the Road*
- Helen Keller – Excerpt from *The Story of My Life – Chapter IV*

Listening: Audio summary comprehension

Speaking: Discussion on freedom & learning

Reading: Passage comprehension

Writing: Reflective paragraph writing

UNIT III	Poetry	9 Hours

- William Wordsworth – *The Solitary Reaper*
- Rabindranath Tagore – *Where the Mind is Without Fear*

Listening: Infer the central idea of the poem.

Speaking: Sharing personal interpretation of the poem

Reading: Read aloud exercise

Writing: Critical Appreciation

UNIT IV	Short stories	9 Hours

- O. Henry – *The Gift of the Magi*
- R.K. Narayan – *An Astrologer's Day*

Listening: Story narration

Speaking: Retell the story

Reading: Silent reading and reflective reading

Writing: Summary & Character analysis

UNIT V	One-Act Play	9 Hours

- Douglas Turner Ward-*The Shirt*
- J. M. Synge-*Riders to the Sea*

Listening: Listening to dialogue delivery

Speaking: Role play and enactment

Reading: Character mapping and identification of key ideas

Writing: Dialogue writing & Short critical commentary

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS:

1. Naik, M. K., ed *Indian Prose in English: An Anthology*. Oxford University Press, 2001.
2. Greenblatt, Stephen, ed. *The Norton Anthology of English Literature*. 9th ed., W. W. Norton & Company, 2012.
3. Henry, O. *Selected Short Stories of O. Henry*. Penguin Classics, 2001.
4. Narayan, R. K. *Malgudi Days*. Indian Thought Publications, 1982.
5. Wren, P. C., and H. Martin. *High School English Grammar and Composition.* Revised ed., S. Chand & Company, 2009.
6. McCarthy, Michael, and Felicity O'Dell. *English Vocabulary in Use*. 4th ed., Cambridge University Press, 2017.

REFERENCES BOOKS

1. Murphy, Raymond. *English Grammar in Use*. Cambridge University Press, 2019.
2. Strunk Jr., William, and E. B. White. *The Elements of Style*. 4th ed., Longman, 2000.
3. Quirk, Randolph, et al. *A Comprehensive Grammar of the English Language*. Longman, 1985.
4. Hacker, Diana, and Nancy Sommers. *The Bedford Handbook*. 11th ed., Bedford/St. Martin's, 2020.

WEBSITES:

1. British Council. *LearnEnglish*. British Council, https://learnenglish.britishcouncil.org.
2. Duolingo. *Duolingo*. Duolingo Inc., https://www.duolingo.com.

BBC. *BBC Learning English*. BBC, https://www.bbc.co.uk/learningenglish.

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Demonstrate understanding of prose, poetry, and short stories.	K2
CO2	Analyze reading comprehension texts and develop critical thinking skills.	K4
CO3	Apply language skills to improve accuracy and clarity in communication.	K3
CO4	Recall and use appropriate vocabulary in different contexts.	K1
CO5	Evaluate digital tools for effective communication and presentation skills.	K5

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	2	–	–	–	2	3	3	2	–	–	2
CO2	3	–	–	–	2	3	3	2	–	–	3
CO3	2	-	-	-	2	3	2	2	–	–	2
CO4	2	–	–	–	2	2	3	2	–	–	2
CO5	2	-	-	-	2	3	3	3	–	–	3
AVG	2.2	-	-	-	2.0	2.8	2.8	2.2	–	–	2.4

26CBDS11	FUNDAMENTALS OF DATA SCIENCE	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To introduce students to the fundamental concepts and principles of data science
- To develop understanding of data types, data collection, and data pre-processing techniques
- To familiarize students with basic statistical concepts and exploratory data analysis
- To provide hands-on experience with data visualization tools and techniques
- To introduce machine learning concepts and basic algorithms for data analysis
- To develop problem-solving skills using data-driven approaches.

UNIT I	INTRODUCTION TO DATA SCIENCE	9 Hours

Introduction to Data Science – Definition and scope – Applications of Data Science – Data Science life-cycle – Role of Data Scientist – Types of data: Structured, Semi-structured, and Unstructured data – Big Data concepts: Volume, Velocity, Variety, Veracity, and Value – Data Science vs Traditional Analytic – Real-world applications of Data Science.

UNIT II	DATA COLLECTION AND MANAGEMENT	9 Hours

Sources of data – Primary and Secondary data – Data collection methods – Databases and data repositories – Introduction to Relational Databases and NoSQL databases – Data formats: CSV, JSON, XML – Data quality issues – Data ethics and privacy – Introduction to cloud storage for data.

UNIT III	DATA PROCESSING & ANALYSIS	9 Hours

Data cleaning techniques – Handling missing values and outliers – Data transformation – Data normalization and standardization – Introduction to descriptive statistics – Measures of central tendency and dispersion – Correlation and covariance – Data sampling techniques.

UNIT IV	DATA VISUALIZATION	9 Hours

Introduction to data visualization – Importance of visual representation – Types of charts and graphs – Bar charts, pie charts, histograms, scatter plots, and box plots – Data storytelling concepts – Visualization tools: Excel, Tableau basics, Python plotting libraries (Matplotlib/Seaborn basics).

UNIT V	INTRODUCTION TO MACHINE LEARNING AND ANALYTICS	9 Hours

Introduction to Machine Learning – Types of Machine Learning: Supervised, Unsupervised, and Reinforcement Learning – Basic algorithms: Linear Regression, Logistic Regression, Decision Trees, and Clustering – Model training and testing concepts – Applications of AI and Machine Learning – Emerging trends in Data Science.

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS:

1. Wagh, S. J., Bhende, M. S., & Thakare, A. D. (2025). Fundamentals of data science. CRC Press.
2. Kumar, T. S., et al. (2025). Foundations of data science. RK Publication.
3. Timbers, T., Campbell, T., Lee, M., Ostblom, J., & Heagy, L. (2025). Data science: A first introduction with Python. Chapman & Hall/CRC.

REFERENCE BOOKS:

1. Codewell, Z. (2025). Data science basics. Publifye AS.
2. Kalita, J. K., Bhattacharyya, D. K., & Roy, S. (2023). Fundamentals of data science: Theory and practice. Elsevier.
3. Bruce, P., Bruce, A., & Gedeck, P. (2020). Practical statistics for data scientists: 50+ essential concepts using R and Python (2nd ed.). O'Reilly Media.
4. VanderPlas, J. (2023). Python data science handbook: Essential tools for working with data (2nd ed.). O'Reilly Media.

WEB LINKS:

1. Introduction to Data Science & Management https://skillsbuild.org/students/course-catalog/data-science
2. Data Preprocessing & Cleaning https://medium.com/@saurabhshirole1/data-cleaning-preprocessing-in-data-science-a-complete-practical-guide-b2513c0d50f0
3. https://www.mygreatlearning.com/academy/learn-for-free/courses/exploratory-data-analysis-projects#:~:text=About%20this%20course,EDA%20and%20build%20insightful%20visualiza tions.
4. https://www.oracle.com/in/analytics/what-is-machine-learning-for-analytics/#:~:text=Machine%20learning%20for%20analytics%20is%20the%20process,in%20 two%20ways:%201.%20Providing%20analytics%2Ddriven%20insights.

NPTEL LINKS:

1. Preview: Python for Data Science | SWAYAM
2. Preview: Data Science Using Python | SWAYAM

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Explain the fundamental concepts, lifecycle, applications, and significance of Data Science, including different types of data and Big Data characteristics.	K2
CO2	Understand various data collection methods, data sources, database systems, data formats, cloud storage, and ethical considerations of handling data in Data Science.	K1
CO3	Perform data preprocessing and basic statistical analysis using techniques such as data cleaning, transformation, normalization, handling missing values, and descriptive statistical measures.	K3
CO4	Create effective visual representations of data using charts, graphs, and visualization tools to communicate insights and support data-driven decision-making	K4
CO5	Apply the fundamentals of Machine Learning models and applications for real-world problem-solving.	K3

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	P O4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	3	3	-	-
CO2	3	-	-	-	-	-	-	-	2	3	-	-
CO3	3	3	-	3	-	-	-	-	2	3	3	-
CO4	3	3	-	3	-	-	-	-	3	3	-	3
CO5	3	-	-	-	-	-	-	-	3	-	3	-
AVG	3	3	-	3	-	-	-	-	2.6	3	3	3

26CBDS12	DIGITAL LOGICS AND CIRCUIT DESIGN	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To introduce the basic concepts of digital systems and number systems.
- To understand Boolean algebra and logic gate implementation.
- To design and simplify combinational logic circuits.
- To analyze sequential circuits and memory elements.
- To study digital logic design concepts used in computer systems.

UNIT I	DIGITAL SYSTEMS AND NUMBER SYSTEMS	9 Hours

Introduction to digital systems – Analog vs Digital systems – Binary number system – Decimal, Octal and Hexadecimal number systems – Number system conversions – Binary arithmetic (addition, subtraction, multiplication and division) – Signed binary numbers – 1's and 2's complement representation – Binary codes (BCD, Gray code) – Error detection codes.

UNIT II	BOOLEAN ALGEBRA AND LOGIC GATES	9 Hours

Basic postulates and theorems of Boolean algebra – De Morgan's theorems – Simplification of Boolean expressions – Logic gates: AND, OR, NOT, NAND, NOR, XOR, XNOR – Universal gates – Implementation of Boolean expressions using logic gates – Truth tables and logic diagrams.

UNIT III	COMBINATIONAL LOGIC CIRCUITS	9 Hours

Introduction to combinational circuits – Canonical and standard forms – Karnaugh Maps (K-map) simplification – Design of combinational circuits – Half adder and Full adder – Half subtractor and Full subtractor – Multiplexers – Demultiplexers – Encoders – Decoders.

UNIT IV	SEQUENTIAL LOGIC CIRCUITS	9 Hours

Introduction to sequential circuits – Latches and Flip-Flops – SR flip-flop – JK flip-flop – D flip-flop – T flip-flop – Characteristic tables and excitation tables – Registers – Shift registers – Counters (Asynchronous and Synchronous counters).

UNIT V	DIGITAL LOGIC DESIGN APPLICATIONS	9 Hours

Memory devices – ROM, RAM, PROM, EPROM – Programmable logic devices – Digital integrated circuits – Analog to Digital Converters (ADC) – Digital to Analog Converters (DAC) – Applications of digital logic circuits in computing systems.

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS:

1. Brown, S. D., & Vranesic, Z. G. (2025). Fundamentals of digital logic with Verilog design (2025 Release ed.). McGraw-Hill Education.
2. Rabaey, J. M., Chandrakasan, A., & Nikolic, B. (2021). Digital integrated circuits: A design perspective (3rd ed.). Pearson.
3. Barua, P. (2025). Combinational logic design. Amazon Digital Services LLC – KDP.

REFERENCE BOOKS:

1. Zappa, F., & Asquini, R. (2025). Digital electronic components: Logic gates and families, combinational and sequential components, memories, and 8-bit microcontrollers. Società Editrice Esculapio.
2. De Marco, P. (2025). The logic of digital systems. Pasquale De Marco Publications.

WEBSITES AND WEB SOURCES

1. MIT OpenCourseWare – https://ocw.mit.edu
2. GeeksforGeeks – https://www.geeksforgeeks.org
3. TutorialsPoint – https://www.tutorialspoint.com
4. Khan Academy – https://www.khanacademy.org

NPTEL LINKS

1. https://nptel.ac.in/courses/108105113?utm_source=chatgpt.com

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand the fundamental concepts of digital systems, number systems, binary arithmetic, complements, binary codes, and error detection techniques used in digital electronics.	K2
CO2	Apply Boolean algebra principles, logic gate operations, and simplification techniques to design and implement digital logic expressions and circuits.	K3
CO3	Apply Karnaugh map simplification and combinational logic design techniques to develop arithmetic and data routing circuits such as adders, subtractors, multiplexers, encoders, and decoders.	K3
CO4	Understand the concepts and operations of sequential logic circuits including flip-flops, registers, and counters used in digital system design.	K2
CO5	Analyze memory devices, programmable logic devices, ADC, DAC, and digital integrated circuits in designing and analyzing	K4

	digital system applications.	

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	3	-	-	-
CO2	3	-	3	-	-	-	-	-	2	-	-	-
CO3	3	3	3	-	-	-	-	-	2	-	-	-
CO4	3	3	3	-	-	-	-	-	3	-	-	-
CO5	3	3	3	-	-	-	-	-	3	-	-	-
AVG	3	3	3	-	-	-	-	-	2.6	-	-	-

26BMA001	MATHEMATICS–I	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To learn various concept in matrix
- To apply the concept of Sets to promote critical thinking, problem-solving technique and interdisciplinary connections.
- To analyse the relationships, decisions making and modeling complex systems using Partial Order Relations.

UNIT I	MATRICES & DETERMINANTS	9 Hours

Matrices: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, Cramer's Rule, Rank of Matrix Dependence of Vectors**. Determinants:** Definition, Minors, Cofactors, Properties of Determinants

UNIT II	SETS	9 Hours

Sets: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, CaPPRDinality of Set, Simple Applications.

UNIT III	RELATIONS & FUNCTIONS	9 Hours

Relations: Properties of Relations, Equivalence Relation. **Functions:** Partial OPPRDer Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions,

UNIT IV	PARTIAL ORDER RELATIONS	9 Hours

Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, GLB, LUB.

UNIT V	NUMBER SYSTEM AND CONVERSIONS	9 Hours

Number Systems: Binary Numbers, Octal Numbers, Decimal numbers, Hexa Decimal numbers. **Number base conversions**: Octal and Hexa Decimal Numbers - Complements - Signed Binary Numbers - Binary Arithmetic - Binary Codes - Decimal Code

Total: 45 Hours

Self-Learning: 45 Hours

TEXTBOOK

1. Kolman, Busby, Ross and Rehman (2003), Discrete Mathematical Structures for Computer Science, Pearson Education, 5th Edition,

REFERENCE BOOKS

1.D.S. Malik and M.K. Sen(2004), Discrete Mathematical Structures: Theory and Applications, Thomson.

2. Goodaire & Parmenter (2000), Discrete Mathematics & Graph Theory, Pearson Education.

3. Kenneth H. Rosen, (2004), Discrete Mathematics and its Applications, Tata McGraw Hill, 5th Ed.

4. C.L. Liu (1986), Elements of Discrete Mathematics, 2nd Edition, McGraw Hill

WEB LINKS:

1. https://www.geeksforgeeks.org/mathematics-partial-oPPRDers-lattices/

2. https://www.ipsgwalior.org/download/number%20system.pdf

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand matrices and determinants including operations, inverse, rank, and properties.	K1
CO2	Explain sets and set operations such as union, intersection, complement, and Cartesian product.	K2
CO3	Apply relations and functions including equivalence relations, domain, range, and composition.	K3
CO4	Analyze partial order relations, Hasse diagrams, chains, GLB and LUB concepts.	K4
CO5	Evaluate number systems, conversions, binary arithmetic, and coding systems.	K5

CO PO ARTICULATION MATRIX

COs / POs-PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3
CO1	3	2	2	–	2	3	2	–	–	–	3	2
CO2	3	2	2	–	2	3	2	–	–	–	3	2
CO3	3	3	3	–	2	3	2	2	–	–	3	2
CO4	3	3	3	–	2	2	2	2	–	–	2	2
CO5	3	3	3	–	2	3	2	2	–	–	3	2
Avg	3.0	2.6	2.6	–	2.0	2.8	2.0	0.8	–	–	2.8	2.0

26CBDS13	PROBLEM SOLVING AND PROGRAMMING	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To introduce students to the fundamentals of problem solving using programming techniques.
- To develop logical thinking and algorithmic problem-solving skills.
- To understand programming concepts such as variables, operators, and control structures.
- To implement programs using functions, arrays, and modular programming techniques.
- To apply programming concepts to solve real-world computational problems.

UNIT I	INTRODUCTION TO PROBLEM SOLVING AND PROGRAMMING	9 Hours

Problem solving concepts – Problem analysis – Algorithm design – Flowcharts and pseudocode – Characteristics of algorithms – Programming languages and translators – Introduction to C programming – Structure of a C program – Tokens, keywords, identifiers, constants and variables – Data types – Input and output statements.

UNIT II	OPERATORS AND CONTROL STRUCTURES	9 Hours

Operators in C – Arithmetic, relational, logical, assignment and conditional operators – Operator precedence – Decision making statements (if, if-else, nested if, switch) – Looping statements (while, do-while, for loops) – Break and continue statements – Simple programming examples using control structures.

UNIT III	ARRAYS AND STRINGS	9 Hours

Introduction to arrays – One-dimensional arrays – Two-dimensional arrays – Array operations – Introduction to strings – String handling functions – String manipulation programs – Applications of arrays and strings in problem solving.

UNIT IV	FUNCTIONS AND MODULAR PROGRAMMING	9 Hours

Concept of functions – Function declaration and definition – Function parameters and return values – Types of functions – Recursive functions – Storage classes – Scope and lifetime of variables – Modular programming concepts.

UNIT V	POINTERS, STRUCTURES AND FILE HANDLING	9 Hours

Introduction to pointers – Pointer operations – Pointers and arrays – Structures and unions – Structure variables and arrays – File handling concepts – File operations (open, read, write, close) – Applications of file processing.

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS:

1. Sridhar, S., Sridhar, S. S., & Hariharan, V. M. (2025). Problem solving and programming in C: A computational thinking approach. Pearson Education India.
2. Saxena, A., Arya, N., & Tanwar, A. (2025). Modern approach to C programming. BPB Publications.
3. Balagurusamy, E. (2025). Programming in ANSI C (6th ed.). Tata McGraw-Hill Education.
4. Kamaldeep, D. (2024). Programming for problem-solving with C. BPB Publications.

REFERENCE BOOKS:

1. Bhoi, G., & Shetage, S. (2025). Problem solving using C programming. LAP Lambert Academic Publishing.
2. King, K. N. (2022). C programming: A modern approach (2nd ed.). W. W. Norton & Company.
3. Deitel, P., & Deitel, H. (2022). C how to program (9th ed.). Pearson.
4. Prata, S. (2024). C primer plus (6th ed.). Pearson Education.

WEBSITES AND WEB SOURCES

1. **MIT OpenCourseWare – https://ocw.mit.edu**
2. **GeeksforGeeks – https://www.geeksforgeeks.org**
3. **TutorialsPoint – https://www.tutorialspoint.com**
4. **W3Schools – https://www.w3schools.com**

NPTEL LINK

1. https://nptel.ac.in/courses/106105171

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand the fundamental concepts of problem solving, algorithm design, flowcharts, pseudocode, programming languages, and basic C programming constructs for developing computational solutions.	K2
CO2	Apply operators, decision-making statements, and looping constructs in C programming to develop programs for solving logical and computational problems.	K3
CO3	Apply arrays and string handling techniques in C programming to store, manipulate, and process data efficiently for problem-solving applications.	K3
CO4	Apply functions, recursion, storage classes, and modular programming concepts to develop structured and reusable C programs.	K3
CO5	Apply pointers, structures, unions, and file handling techniques in C programming to develop efficient programs for data processing and real-world applications.	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	3	3	3	-	-	-	-	-	3	-	-
CO2	3	3	3	-	-	-	-	-	2	-	-
CO3	3	3	3	-	-	-	-	-	2	-	-
CO4	3	3	3	-	-	-	-	-	3	-	-
CO5	3	3	3	-	-	-	-	-	3	-	-
AVG	3	3	3	-	-	-	-	-	2.6	-	-

26PBDS11	PROBLEM SOLVING AND PROGRAMMING	L	T	P	SL	C

	LAB	0	0	2	2	1

COURSE OBJECTIVES

- To introduce students to the basic structure and syntax of the C programming language for developing simple programs.
- To develop problem-solving skills using operators, decision-making statements, and looping constructs in C programming.
- To enable students to implement programs using arrays, strings, and functions for structured programming.
- To familiarize students with advanced concepts such as recursion, structures, and file handling in C.
- To enhance logical thinking and programming ability through practical problem-solving and debugging techniques

	LIST OF EXPERIMENTS:	15 Hours

1. Converting degrees Celsius to Fahrenheit and vice versa
2. Display three input numbers in sorted (non-decreasing) order
3. Given a positive integer value n (>= 0) display number, square and cube of numbers from 1 to n in a tabular format?
4. Given an input positive integer number, display odd numbers from in the range [1,n]?
5. Display first mathematical tables, each table up to 10 rows? Generalise this to display first n (> 0) mathematical tables up to m (m > 0) rows?
6. Display following patterns of n rows (n > 0), For the below examples n = 5? For each pattern write a separate algorithm/program

$ $$ $$$ $$$$ $$$$$	$ $$ $$$ $$$$ $$$$$	12345 1234 123 12 1	12345 1234 123 12 1

7. Display the following patterns of n rows (n > 0), for the below examples n = 5?

Hollow square pattern:	Triangle Patterns with numbers:	Square with diagonals:	Diamond Pattern
##### # # # # # # #####	1 121 12321 1234321 123454321	* * * * * * * * * * * * * * * * * * * * *	* *** ***** *** *

8. Given the first term (a), difference/multiplier (d) and number of terms (n > 0), display the first n terms of the arithmetic/geometric progression?
9. Given two positive integer numbers n1 and n2 check if the numbers are consecutive numbers of the fibonacci sequence?
10. Given a sequence of digits form the number composed of the digits. Use sentinel controlled repetition to read the digits followed by-1. For example, forthe input 2 7 3 2 9-1 the output number is 27329?
11. Checkif a given positive integer number is a palindrome or not? 4. Compute character grade from the marks (0 ≤ marks ≤ 100) of a subject. Grading Scheme: 80-100 : A, 60- 79: B, 50- 59: C, 40-49: D, 0-39: F? Solve this using both else-if ladder and switch case?
12. Checkif a given positive integer number is a prime number or not?
13. Computeprime factors of a positive integer number?
14. Checkif two positive integer numbers are amicable numbers or not?
15. Checkif a given positive integer number is a perfect number or not?
16. Check if a given positive integer number Armstrong number or not?
17. Converting a positive integer number (n > 0) from one base (inputBase) to another base (outputBase) (2 <= input Base, outputBase <= 10). Input number should be validated before converting to make sure the number uses only digits allowed in the input base?
18. Write a program to display a number in text form. For example If the number is 5432 the output should be “FIVE FOUR THREE TWO”?
19. Implement your own string length and string reversal functions?
20. Design algorithm/program to perform matrix operations addition, subtraction and transpose?
21. Write a recursive program to count the number of digits of a positive integer number?

Total :15 Hours
Self Learning: 15 Hours

TEXT BOOKS:

1. Sridhar, S., Sridhar, S. S., & Hariharan, V. M. (2025). Problem solving and programming in C: A computational thinking approach. Pearson Education India.
2. Saxena, A., Arya, N., & Tanwar, A. (2025). Modern approach to C programming. BPB Publications.
3. Balagurusamy, E. (2025). Programming in ANSI C (6th ed.). Tata McGraw-Hill Education.
4. Kamaldeep, D. (2024). Programming for problem-solving with C. BPB Publications.

REFERENCE BOOKS:

1. Bhoi, G., & Shetage, S. (2025). Problem solving using C programming. LAP Lambert Academic Publishing.
2. King, K. N. (2022). C programming: A modern approach (2nd ed.). W. W. Norton & Company.
3. Deitel, P., & Deitel, H. (2022). C how to program (9th ed.). Pearson.
4. Prata, S. (2024). C primer plus (6th ed.). Pearson Education.

WEBLINKS:

1. W3Schools – https://www.w3schools.com/c/
2. GeeksforGeeks – https://www.geeksforgeeks.org/c-programming-language/
3. Programiz – https://www.programiz.com/c-programming
4. TutorialsPoint – https://www.tutorialspoint.com/cprogramming

NPTEL LINK

1. https://nptel.ac.in/courses/106105171

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Apply basic C programming concepts including program structure, data types, operators, input/output statements, and conditional constructs to develop simple computational programs.	K3
CO2	Apply looping statements, recursion, and functions in C programming to solve mathematical and logical problems efficiently.	K3
CO3	Develop programs using one-dimensional and two-dimensional arrays, strings, and related operations for data manipulation and problem solving.	K3
CO4	Apply modular programming concepts, structures, and user-defined functions to develop organized and reusable C programs.	K3
CO5	Analyze and implement file handling operations in C programming for storing, retrieving, and processing data in real-world applications.	K4

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	3	3	3	-	-	-	-	-	3	-	-
CO2	3	3	3	-	-	-	-	-	2	-	-
CO3	3	3	3	-	-	-	-	-	2	-	-
CO4	3	3	3	-	-	-	-	-	3	-	-
CO5	3	3	3	-	-	-	-	-	3	-	-
AVG	3	3	3	-	-	-	-	-	2.6	-	-

26PBDS12	DATA ANALYTICS USING SPREADSHEET	L	T	P	SL	C
		0	0	3	3	1

COURSE OBJECTIVES

- To introduce students to the basic concepts and environment of spreadsheet tools for data analysis.
- To develop skills in organizing, formatting, and managing data using spreadsheets.
- To enable students to apply formulas and functions for performing data calculations and analysis.
- To provide knowledge of data visualization techniques using charts and graphs.
- To develop the ability to analyze datasets and generate meaningful insights using spreadsheet tools.

LIST OF EXPERIMENTS: 15 Hours

1. Create a worksheet to enter and format student information including name, register number, course, and marks
2. Create a worksheet to perform basic calculations using formulas such as addition, subtraction, multiplication, and division.
3. Apply functions like SUM, AVERAGE, MIN, MAX, and COUNT to analyze a dataset of student marks.
4. Use logical functions such as IF, AND, OR to determine pass or fail status based on marks.
5. Create a dataset and demonstrate sorting data in ascending/descending order and applying filters.
6. Highlight specific data using conditional formatting (e.g., highlight marks above 80 or below 40).
7. Create a worksheet using data validation to restrict input values such as dropdown lists for course names or grades.
8. Create charts such as bar chart, pie chart, and line chart to visualize sales or student performance data.
9. Create a pivot table to summarize and analyze a dataset such as monthly sales or department performance.
10. Use lookup functions such as VLOOKUP or HLOOKUP to retrieve data from a table.
11. Analyze a dataset of sales records and calculate totals, averages, and performance indicators.
12. Create a simple data dashboard using charts and summary tables to present insights from a dataset.

Total: 15 Hours

Self Learning: 15 Hours

TEXT BOOKS:

1. Manzo, J. M. (2025). Data analytics using Excel® Microsoft® 365: With accounting and finance datasets (Version 4.0). FlatWorld.
2. Ragsdale, C. (2022). Spreadsheet modeling and decision analysis: A practical introduction to business analytics (9th ed.). Cengage Learning.
3. Powell, S. G., & Baker, K. R. (2024). Business analytics: The art of modeling with spreadsheets (5th ed.). Wiley.

REFERENCE BOOKS:

1. Winston, W. L. (2023). Microsoft Excel data analysis and business modeling (7th ed.). Microsoft Press.
2. McFedries, P. (2024). Microsoft Excel 365 formulas and functions. Pearson Education.
3. Walkenbach, J. (2023). Excel 365 bible. Wiley.

WEBLINKS:

1. Microsoft Excel Training - https://support.microsoft.com/excel
2. Excel Tutorials – W3Schools - https://www.w3schools.com/excel
3. Spreadsheet Tutorials – TutorialsPoint - https://www.tutorialspoint.com/excel
4. Data Analysis Tutorials – Excel Easy - https://www.excel-easy.com
5. Data Analytics Learning Resources – Kaggle - https://www.kaggle.com/learn

NPTEL LINK

1. https://nptel.ac.in/courses/110106064

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Apply spreadsheet operations, formatting techniques, and basic formulas to organize and manage data efficiently.	K3
CO2	Apply mathematical, statistical, and logical functions in spreadsheets to perform data analysis and decision-making tasks.	K3
CO3	Apply sorting, filtering, conditional formatting, and data validation techniques for effective data management and presentation.	K3
CO4	Develop charts, pivot tables, and lookup functions to summarize, retrieve, and visualize data for analytical purposes.	K3
CO5	Analyze datasets and create interactive dashboards using spreadsheet tools to generate insights and support data-driven decision making.	K4

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	3	3	-
CO2	3	3	3	-	-	-	-	-	2	3	-
CO3	3	3	3	-	-	-	-	-	2	3	-
CO4	3	3	3	3	-	-	-	-	3	3	-
CO5	3	3	3	3	-	-	-	-	3	3	-
AVG	3	3	3	3	-	-	-	-	2.6	3	-

26BVAC13	ENVIRONMENTAL SCIENCE AND SUSTAINABILITY	L	T	P	SL	C
		2	0	0	2	2

COURSE OBJECTIVES

- To familiarize students with basic environmental concepts, their relevance to business operations, and forthcoming sustainability challenges.
- To equip students to make decisions that consider environmental consequences.
- To enable future business graduates to become environmentally sensitive and responsible managers.

UNIT I	UNDERSTANDING ENVIRONMENT, NATURAL RESOURCES, AND SUSTAINABILITY	6 Hours

Fundamental environmental concepts and their relevance to business operations; Components and segments of the environment, the man-environment relationship, and historical environmental movements. Concept of sustainability; Classification of natural resources, issues related to their overutilization, and strategies for their conservation. Sustainable practices in managing resources, including deforestation, water conservation, energy security, and food security issues. The conservation and equitable use of resources, considering both intergenerational and intergenerational equity, and the importance of public awareness and education.

UNIT II	ECOSYSTEMS, BIODIVERSITY, AND SUSTAINABLE PRACTICES	6 Hours

Various natural ecosystems, learning about their structure, functions, and ecological characteristics. The importance of biodiversity, the threats it faces, and the methods used for its conservation. Ecosystem resilience, homeostasis, and carrying capacity, emphasizing the need for sustainable ecosystem management. Strategies for in situ and ex situ conservation, nature reserves, and the significance of India as a mega diverse nation.

UNIT III	ENVIRONMENTAL POLLUTION, WASTE MANAGEMENT, AND SUSTAINABLE DEVELOPMENT	6 Hours

Various types of environmental pollution, including air, water, noise, soil, and marine pollution, and their impacts on businesses and communities. Causes of pollution, such as global climate change, ozone layer depletion, the greenhouse effect, and acid rain, with a particular focus on pollution episodes in India. Importance of adopting cleaner technologies; Solid waste management; Natural and man-made disasters, their management, and the role of businesses in mitigating disaster impacts.

UNIT IV	SOCIAL ISSUES, LEGISLATION, AND PRACTICAL	6 Hours

	APPLICATIONS	
Dynamic interactions between society and the environment, with a focus on sustainable development and environmental ethics. Role of businesses in achieving sustainable development goals and promoting responsible consumption.		
UNIT V	**ENVIRONMENTAL LEGISLATION**	**6 Hours**
Overview of key environmental legislation and the judiciary's role in environmental protection, including the Water (Prevention and Control of Pollution) Act of 1974, the Environment (Protection) Act of 1986, and the Air (Prevention and Control of Pollution) Act of 1981. Environmental justice, environmental refugees, and the resettlement and rehabilitation of affected populations; Ecological economics, human population growth, and demographic changes in India.		

Total: 30 Hours

Self-Learning: 30 Hours

TEXT BOOKS:

1. Poonia, M.P. *Environmental Studies* (3rd ed.), Khanna Book Publishing Co.
2. Bharucha, E. *Textbook of Environmental Studies* (3rd ed.) Orient Blackswan Private Ltd.
3. Dave, D., & Katewa, S. S. *Text Book of Environmental Studies.* Cengage Learning India Pvt Ltd.
4. Rajagopalan, R. *Environmental studies: from crisis to cure* (4th ed.). Oxford University Press.
5. Miller, G.T. & Spoolman S. *Living in the Environment*. (20th ed.). Cengage.
6. Basu, M., & Xavier Savarimuthu, S. J. *Fundamentals of environmental studies*. Cambridge University Press.

REFERENCES:

1. Roy, M. G. Sustainable Development: Environment, Energy and Water Resources. Ane Books.
2. Pritwani, K. Sustainability of business in the context of environmental management. CRC Press.
3. Wright, R.T. & Boorse, D.F. Environmental Science: Toward A Sustainable Future (13th ed,). Pearson.

WEBSITE:

1. https://www.ourplanet.com
2. https://www.undp.org/content/undp/en/home/sustainable-development-goals.html
3. www.myfootprint.org
4. https://www.globalchange.umich.edu/globalchange1/current/lectures/kling/ecosystem/ecosystem.html

NPTEL LINKS:

1. https://nptel.ac.in/courses/127106004?utm_source=chatgpt.com

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand the fundamental concepts of environment, sustainability, natural resources, and their importance in achieving ecological balance and sustainable development.	K2
CO2	Explain the structure and functions of ecosystems, biodiversity conservation methods, and sustainable ecosystem management practices.	K2
CO3	Understand the causes and impacts of environmental pollution, waste management practices, disaster management, and the importance of cleaner technologies for sustainable development.	K2
CO4	Explain environmental ethics, sustainable development goals, social issues, and the role of individuals, society, and businesses in environmental protection and responsible resource utilization.	K2
CO5	Understand environmental legislation, environmental protection acts, environmental justice, demographic changes, and their significance in environmental conservation and sustainable societal development.	K2

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	-	-	-	-	-	-	3	-	2	-	-
CO2	-	-	-	-	-	-	3	-	2	-	-
CO3	-	-	-	-	-	-	3	-	2	2	-
CO4	-	-	-	-	-	-	3	-	2	2	-
CO5	-	-	-	-	-	-	3	-	2	-	-
AVG	-	-	-	-	-	-	3	-	2	2	-

26BVAC11	INDIAN KNOWLEDGE SYSTEM	L	T	P	SL	C
		2	0	0	2	2

COURSE OBJECTIVES

- To Gain an understanding of Indian Knowledge System.
- To develop an ability to apply the Indian Knowledge System to societal challenges faced today in areas such as holistic health, governance, public administration and sustainable living.
- To Promote the youths to do research in the various fields of Indian knowledge system

UNIT I	AN OVERVIEW OF INDIAN KNOWLEDGE SYSTEM	6 Hours

Introduction- Organization of Indian Knowledge System- The IKS corpus- A Classification framework- Historicity of Indian KnowledgeSystem -Some salient aspects of Indian Knowledge System.

UNIT II	PHILOSOPHICAL SYSTEM	6 Hours

Introduction to Philosophy- Development of Indian Philosophical system - Unique features of Indian Philosophical system- Introduction to Yoga.

UNIT III	GOVERNANCE AND PUBLIC ADMINISTRATION	6 Hours

Introduction - Understanding Governance from ancient to modern times- Relevance of Arthashastra- Glimpses of Nitishastra- Vidura Niti.

UNIT IV	WISDOM THROUGH THE AGES	6 Hours

Gateways of ancestral wisdoms-Introduction to Purāṇa- The Purāṇic repository- Issues of interest in Purāṇas- Introduction to Itihāsas- Key messages in Itihāsa-Wisdom through Nīti- śāstra.

UNIT V	MATHEMATICS	6 Hours

Introduction to Indian Mathematics- Unique aspects of Indian Mathematics- Indian Mathematicians and their Contributions.

Total: 30 Hours

Self-Learning: 30 Hours

TEXT BOOKS:

1. Kapoor Kapil, and Singh Avadesh Kumar, Indian Knowledge System Vol.1, DK PrintWorld,Ltd. 2005

REFERENCE BOOKS:

1. The Knowledge System of Bhārata by Bhag Chand Chauhan.
2. Histrory of Science in India Volume-1, Part-I, Part-II, Volume VIII, by Sibaji Raha, et al.National Academy of Sciences, India and The Ramkrishan Mission Institute of Culture, Kolkata

WEB LINKS:

1. https://onlinecourses.swayam2.ac.in/imb23_mg54/preview
2. https://digest.iimb.ac.in/2022/04/book-indian-knowledge-systems-co-authored-dr-b-mahadevan/
3. https://www.summarize.tech/www.youtube.com/watch?v=jcV0LIp570A

NPTEL LINKS:

1. https://share.google/FYh1V0rJs5Kkd055c

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Classify the key concepts of Indian Knowledge System and discuss the multi-faceted nature of knowledge contained in the Traditional Systems of India.	K2 / K4
CO2	Identify the rich heritage of governance in Indian Knowledge System.	K2
CO3	Recognize the relevance of Arthashastra in public administration.	K2 / K4
CO4	Identify the wisdom through ages through Ithihasas.	K1 / K2
CO5	Gain knowledge of Indian mathematicians and their contributions.	K1 / K2

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	-	-	-	-	-	3	-	-	2	-	-
CO2	-	-	-	-	-	3	-	3	2	-	-
CO3	-	-	-	-	-	3	-	3	2	-	-
CO4	-	-	-	-	-	3	-	3	2	-	-
CO5	-	-	-	-	-	3	-	-	2	-	-
AVG	-	-	-	-	-	3	-	3	2	-	-

SEMESTER II

26LTAM21	TAMIL–II	L	T	P	SL	C
		3	0	0	3	3

பாடத்திட்ட நோக்கம்:

மாணவர்களிடம் தமிழரின் நாகரிகம் மற்றும் பண்பாட்டு மரபினை அறிமுகம் செய்தல் தமிழ் இலக்கிய காப்பியச் செழுமையையும் பக்தி இலக்கிய மாண்பையும் உணர்த்துதல், தமிழ்க் கவிதை வளத்தையும் அதன் பொருண்மைகளையும் எடுத்துரைத்தல், ஊடகம்- கணினி- செயற்கை நுண்ணறிவு போன்ற நவீன அறிவுசார் வளர்ச்சி நிலைகளைப் பயன்பாட்டு நோக்கில் பயிற்சியளித்தல், இதன் வாயிலாக மாணவர்களின் ஆளுமைத் திறனை மேம்படுத்தி அவர்களை போட்டித் தேர்வுகளுக்கு தயார் செய்வதும் வேலைவாய்ப்பிற்கான பயிற்சி அளிப்பதும் இந்தப் பாடத்திட்டத்தின் முக்கிய நோக்கமாகும்

அலகு 1	**தமிழர் வாழ்வும் பண்பாடும்**	**9 மணி நேரம்**

பண்பாடு – வாழ்வியல் முறை – அகம், புறம் - உணவு முறை - விருந்தோம்பல் - நம்பிக்கைகள் – விழாவும் வழிபாடும் - கலைகள் - கட்டடம் - சிற்பம் - ஓவியம் - இசை – கூத்து – தொழிலும் வணிகமும் – அறிவியல் நோக்கு.

அலகு 2	**காப்பியங்கள்**	**9 மணி நேரம்**

1. சிலப்பதிகாரம் – ஆய்ச்சியர் குரவை
2. மணிமேகலை– காதை 19 - உலக அறவி புக்க காதை
3. கம்பராமாயணம் – மந்தரை சூழ்ச்சிப் படலம் (பாடல் எண் தேர்ந்தெடுக்கப்பட்ட 9 பாடல்கள்)

அலகு 3	**பக்தி இலக்கியம்**	**9 மணி நேரம்**

திருமூலர் - திருமந்திரம் – மூன்று பாடல்கள்

- ✓ உடம்பார் அழியின் உயிரார் அழிவர் (திருமந்திரம்: 724)
- ✓ மனையுள் இருந்தவர் மாதவர் ஒப்பர் (திருமந்திரம்:47)
- ✓ மரத்தை மறைத்தது மாமத யானை (திருமந்திரம்: 2290)

தேம்பாவணி - காட்சிப் படலம் முதல் 5 பாடல்கள்

சீறாப்புராணம் - மானுக்கு பிணை நின்ற படலம்

அலகு 4	**கவிதை இலக்கியம்**	**9 மணி நேரம்**

பாரதியார் - செந்தமிழ் நாடு- செந்தமிழ் நாடெனும் போதினிலே எனும் கவிதை (பாடல் எண்1.6, 7, 8, 9, 10) பாரதிதாசன் - இசையமுது- "தூய்மை சேரடா தம்பி" என்று தொடங்கும் பாடல் கவிக்கோ அப்துல்ரகுமான் - ஆலாபனை- போட்டி எனும் தலைப்பில் அமைந்த கவிதை நா.முத்துக்குமார் - பட்டாம்பூச்சி விற்பவன்- தூர் எனும் தலைப்பில் அமைந்த கவிதை இளம்பிறை - நீ எழுத மறுக்கும் எனதழகு - அம்மா எனும் தலைப்பில் அமைந்த கவிதை.		
அலகு 5	**ஊடகத் தமிழ் – கணினித் தமிழ் அறிமுகம்**	**9 மணி நேரம்**
ஊடகத் தமிழ்: இதழியல் - ஊடக வகைகள் - அச்சு ஊடகங்கள் - மின்னணு ஊடகம் - ஊடகங்களில் தமிழ், ஊடகங்களின் மொழி நடை - வானொலி- தொலைக்காட்சி- திரைப்படம். கணினித் தமிழ்: கணினியும் தமிழும், தமிழ் மென்பொருள்கள் (Tamil software) - எழுத்துருக்கள் (Fonts) - இணையமும் தமிழ்ப் பயன்பாடும் - மின்னூலகம் (Online e-Library), மின்னகராதி (e-Dictionary), - மின்வழிக் கற்றல் - e Learning - பயன்பாட்டு நோக்கில் செயற்கை நுண்ணறிவு.		

மொத்தம்; 45 மணிநேரம்
சுய கற்றல்: 45 மணிநேரம்

பார்வை நூல்கள்

1.தமிழர் நாகரிகமும் பண்பாடும், டாக்டர் அ. தட்சிணாமூர்த்தி, ஐந்திணைப் பதிப்பகம், 2001.
2.இதழியல் கலை, டாக்டர் மா. பா. குருசாமி, குரு - தேமொழி பதிப்பகம், திண்டுக்கல், 1998.
3.கணிப்பொறியில் தமிழ், த.பிரகாஷ், பெரிகாம், 2011.
4.தமிழ்க் கணினி இணையப் பயன்பாடுகள், முனைவர் துரை. மணிகண்டன், மணிவானதி பதிப்பகம், 2013.
5.அச்சுக் கலை வழிகாட்டி, பாலசுப்பிரமணியன், ஆ. சென்னை: தனசு பதிப்பகம், 1966
6.பாடநூல் தேடலுக்கான இணையம்
http://www.tamilvu.org/courses/nielit/Chapters/Chapter1/11.pdf

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Describe the civilization, cultural heritage, and traditional practices of the Tamil people through literary and historical perspectives.	K2
CO2	Evaluate the structural richness, themes, and ideological significance of Tamil epics and Bhakti literature.	K5
CO3	Create Tamil poetic compositions using appropriate literary and aesthetic techniques.	K6
CO4	Apply practical knowledge and procedural skills in Tamil computing and digital applications.	K3
CO5	Develop language competence and analytical abilities required for Tamil proficiency and competitive examinations.	K4

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	2	–	2	–	2	3	2	–	–	–	2
CO2	3	–	2	–	2	3	2	–	–	–	2
CO3	3	–	2	–	2	3	2	–	–	-	2
CO4	2	–	2	–	2	2	2	-	-	-	3
CO5	2	–	2	–	2	3	2	–	–	-	2
AVG	2.4	–	2.0	–	2.0	2.8	2.0	-	-	-	2.4

26LHIN21	HINDI–II	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES:

- To introduce students to Hindi and Indian civilization and cultural heritage
- To make them understand the richness of Hindi and Indian epics and the greatness of devotional literature
- To provide practical training in modern intellectual developments such as translation, advertisement and to develop students' skills, for competitive examinations, and provide employment-oriented training are the major objectives of this syllabus.

UNIT I		9 hours

हिन्दी साहित्य का इतिहास - आदि काल, मध्यकाल, आधुनिक युग -सामान्य परिचय, प्राचीन युग - नैतिक साहित्य - तिरुक्कुरल - 5 दोहे (तिरुवल्लुवर),भक्ति काल - नैतिक साहित्य - वेमना (वेमना) के पद - History of Hindi Literature – Ancient, medieval, modern era – General Introduction, Ethical Literature - Thirukkural - 5 couplets (Thiruvalluvar), Bhakti Kal - Ethical Literature - Vemana Pad - 3 (Vemana)

UNIT II		9 hours

भक्ति काल - नैतिक साहित्य - कबीर के दोहे- 5 (कबीरदास), -भ्रमरगीत के पद-1 (सूरदास), कौशल विकास - प्रश्न निर्माण - अभ्यास

Bhakti Kal - Ethical Literature - Kabir ke Dohe - 5 (Kabirdas), Bhramargeet ke Pad -1 (Surdas), Skill Development - Question framing – Exercise

UNIT III		9 hours

भक्ति काल - विनय के पद- 1 (तुलसीदास), कम्ब रामायण के पद - 2 (कम्बर)

Bhakti Kal - Vinay ke Pad - 1(Tulsidas), Kambaramayan ke Pad - 2 (Kambar)

UNIT IV		9 hours

आधुनिक युग - पुष्प की अभिलाषा (माखनलल चतुर्वेदी), कौशल विकास - अनुवाद : अर्थ, परिभाषा, प्रकार एवं अभ्यास Modern Era - Pushpa ki Abhilasha (Makhanlal Chaturvedi), Skill Development - Translation: Meaning, Definition & Exercise

UNIT V		9 hours

आधुनिक युग - बीज व्यथा (ज्ञानेंद्रपति), कौशल विकास - 'विज्ञापन लेखन : अर्थ, परिभाषा, प्रकार एवं अभ्यास

Modern Era - Beej Vyatha (Gyanendrapathi), Skill Development – Advertisement : Meaning, Definition & Exercise

Total: 45 Hours

Self Learning: 45 Hours

संदर्भ ग्रन्थ/ Reference Books:

1. Hindi Sahitya Ka Itihas, Ramchandra Shukla, Nagari Pracharini Sabha, Varanasi
2. Thirukkural, Hindi Translator: M. Govindarajan, Central Institute of Classical Tamil,Chennai
3. Vemana ki vaani,Hindi Translator: Dr. Suryanarayan Bhanu, Potti Sriramulu Telugu University
4. Kabir Granthavali Kabir, Rajkamal Prakashan
5. Sursagar, Surdas, Lokbharti Prakashan
6. Vinay Patrika, Tulsidas, Gita Press, Gorakhpur
7. Kambaramayan, Bhuvan Vani Trust, Lucknow
8. Him Tarangini, Makhanlal Chaturvedi, Bharati Bhandar
9. Anuvaad Vigyan, Dr. Bholanath Tiwari, Kitab Mahal
10. Gyanendra Pati Ki Kavitaayein,Gyanendra Pati, Rajkamal Prakashan
11. Prayojanmoolak Hindi, Dr. Kailash Chandra Bhatia, Vani Prakashan
12. Vyavaharik Hindi – Dr. Hardev Bahri – Rajpal & Sons

वेब लिंक्स/ Web Links:

1. https://www.cict.in
2. https://vaniprakashan.com
3. https://www.rajkamalprakashan.com
4. https://www.gitapress.org
5. https://www.tamiluniversity.ac.in

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Know various types of poetry in Indian languages, culture, moral values, along with the history of Hindi literature.	K1
CO2	Know the richness of ethical and Bhakti literature in Hindi language with cultural and moral values.	K2
CO3	Know the importance of Bhakti literature.	K2
CO4	Apply the value of patriotism and proficiency in Hindi translation.	K4
CO5	Know about modern poetry and develop skills for competitive examinations.	K

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	2	2	–	–	2	3	2	–	–	–	2
CO2	2	–	–	–	2	3	2	–	–	–	3
CO3	2	2	–	–	2	3	2	–	–	-	2
CO4	2	–	–	–	2	3	3	-	-	-	2
CO5	2	2	-	-	3	2	2	–	–	-	3
AVG	2.0	1.2	-	-	2.6	2.8	2.2	-	-	-	2.4

26LFRE21	FRENCH-II	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES:

The lessons are being chosen:

1) To express his / her where abouts and to ask seek direction
2) To express obligation and restriction
3) To describe a place
4) To narrate and to question
5) To describe someone
6) To express his desire and to speak about the future

UNIT I	C'est où	10 hours
L'impératif, Les articles contractés au, à la…, Le passé composé et l'accoPPRD du participle passé avec être.		
UNIT II	**N'oubliez pas**	**6 hours**
Le pronom relatif Qui, que, où, Les pronoms compléments indirects (me, te, lui, leur…) Skill Development - Question framing – Exercise		
UNIT III	**Belle vue sur la mer**	**6 hours**
Les adjectifs démonstratifs, Y- pronom complément.		
UNIT IV	**Quel beau voyage!**	**8 hours**
Les verbes pronominaux, En- pronom complément.		
UNIT V	**Oh ! joli**	**10 hours**
L'imparfait, L'imparfait ou le passé composé.		
UNIT VI	**Et après ?**	**5 hours**
Le futur simple, Le subjonctif présent.		

Total: 45 Hours

Self Learning: 45 Hours

TEXT BOOK:

1. LATITUDES 1 (A1/A2) MÉTHODE DE FRANÇAIS - Régine Mérieux and Yves Loiseau

REFERENCE BOOK:

1. SAISON A1 - MÉTHODE DE FRANÇAIS - Marie-Noëlle Cocton, Élodie Heu, Catherine Houssa, Émilie Kasazian

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Recall and express one's whereabouts and ask for directions.	K1
CO2	Understand and express obligation and restrictions in daily communication.	K2
CO3	Apply language skills to describe a place using appropriate vocabulary.	K3
CO4	Analyze and narrate events and frame questions effectively.	K4
CO5	Apply language structures to describe a person.	K3
CO6	Apply expressions to communicate desires and future plans.	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	2	2	–	–	2	3	2	–	–	–	2
CO2	2	–	–	–	2	3	2	–	–	–	3
CO3	3	2	-	–	2	3	2	–	–	–	2
CO4	2	–	–	–	2	3	3	–	–	–	2
CO5	2	2	–	-	3	2	2	-	-	-	3
AVG	2.2	1.2	-	-	2.6	2.8	2.2	-	-	-	2.4

26LISB21	INDIAN SIGN LANGUAGE - II (ADVANCED)	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- **To Master Advanced Linguistic Structures:** Enable students to understand and apply fundamental grammatical components—including nouns, verbs, and descriptive adjectives—to construct structurally correct sentences in Indian Sign Language (ISL).
- **To Expand Domain-Specific Vocabulary:** Equip learners with specialized lexicon and technical signs related to diverse professions, academic subjects, sports, culinary items, and civic/roadway infrastructure.
- **To Develop Real-World Situational Fluency:** Train students to conduct real-time, functional conversations and handle transactional requests in high-frequency public service areas.
- **To Cultivate Environment-Based Communication Adaptability:** Foster the ability to seamlessly adapt signing styles, contextual terminology, and conversational registers according to specific immediate environments.

UNIT I		9 Hours
Advanced Core Vocabulary & Grammar: Subject, Sports, Noun , and Verb.		

UNIT II		9 Hours
Vocations, Geography & Culinary Terms: Professions, Places, Dishes & Spices, and Roadways.		

UNIT III		9 Hours
Qualifiers & Civic Literacy: Adjectives, Government Related Items, and Calendar Items.		

UNIT IV		9 Hours
Situational Sign Language: Shopping, Hospital, Police Station, and Bus Stop.		

UNIT V		9 Hours
Environment-Based Sign Language: Home, Office, Hotel, and School/College.		

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS :

1. Indian Sign Language Dictionary by Ramakrishna Mission Vidyalaya, IHRDC, Coimbatore

REFERENCE BOOKS:

1. Sign Language in India: A Linguistic Exploration by Dr. Sandeep Sharma Jat .

2. The Indian Sign Language by William P. Clark.

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	**Grammar & Foundations:** Construct grammatically correct sentences in Indian Sign Language (ISL) by accurately applying rules of noun-verb agreement, academic terms, and sports vocabulary.	K3
CO2	**Vocations & Infrastructure:** Demonstrate vocabulary proficiency in identifying various professions, geographical places, culinary terms, and roadway/traffic navigation signs.	K2
CO3	**Qualifiers & Civil Literacy:** Utilize descriptive adjectives to modify signs and communicate effectively about time, calendars, and government/administrative matters.	K3
CO4	**Situational Public Fluency:** Manage independent, real-time communications and transactional interactions in critical public spaces, including shopping centers, hospitals, police stations, and transit hubs.	K4
CO5	**Environment-Based Adaptation:** Adapt signing registers, conversational tone, and specific vocabularies smoothly across domestic, corporate, hospitality, and academic environments.	K5

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	-	-	-	-	-	-	-	2	2	-	-
CO2	-	-	-	-	-	2	-	3	2	-	-
CO3	-	-	-	-	-	3	-	3	2	-	-
CO4	-	-	-	-	-	3	-	3	3	-	-
CO5	-	-	-	-	-	3	-	3	3	-	-
Avg	-	-	-	-	-	2.75	-	2.8	2.4	-	-

26LENG21	ENGLISH-II	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES:

- To appreciate prose, poetry, drama, and short fiction.
- To enhance reading and interpretative skills.
- To express ideas clearly in speech and writing.
- To use appropriate language structures in communication.
- To develop effective writing skills across formats

UNIT I	Grammar & Composition	9 hours

- Active & Passive Voice
- Direct & Indirect Speech
- Letter Writing (Formal & Informal)
- Creative Writing – Writing stories
- Hints Developing

UNIT II	Prose	9 hours

- Nadine Gordimer – *Once upon a Time*
- E. V. Lucas – *Bores*

Listening: Note-taking from audio/text recitation

Speaking: Discussion on fear, society, and behaviour

Reading: Skimming, scanning, and interpretation of textual features

Writing: Reflective paragraph writing

UNIT III	Poetry	9 hours

- Robert Frost – *Stopping by Woods on a Snowy Evening*
- Maya Angelou – *Still I Rise*

Listening: Listening and summarizing the poem

Speaking: Explaining poetic lines orally

Reading: Reading and inferring contextual meaning

Writing: Paraphrase of poems

UNIT IV	Short stories	9 hours

- Anton Chekhov – *The Bet*
- O. Henry – *After Twenty Years*

Listening: Story narration and summarizing

Speaking: Character discussion and debate

Reading: Contextual vocabulary identification

Writing: Summary and character sketch

UNIT V	One-Act Play	9 hours

- Langston Hughes - *Soul Gone Home*
- Lucille Fletcher-*Sorry, Wrong Number*

Listening: Dramatic reading and dialogue comprehension

Speaking: Role play and dramatization

Reading: Character and conflict analysis

Writing: Character sketch/dialogue writing

Total: 45 Hours

Self Learning: 45 Hours

TEXT BOOKS:

- Gordimer, Nadine. "Once upon a Time." *Jump and Other Stories*. Penguin Books, 1991.
- Lucas, E. V. "Bores." *The Best Loved Essays of E. V. Lucas*. Methuen & Co., 1923.
- Frost, Robert. "Stopping by Woods on a Snowy Evening." *New Hampshire*. Henry Holt and Company, 1923.
- Angelou, Maya. "Still I Rise." *And Still I Rise*. Random House, 1978.
- Hughes, Langston. *Soul Gone Home*. In *Five Plays by Langston Hughes*. Indiana University Press, 1963.

REFERENCE BOOKS

- Murphy, Raymond. *English Grammar in Use*. Cambridge University Press, 2019.
- Wren, P. C., and H. Martin. *High School English Grammar and Composition*. Revised ed., S. Chand & Company, 2009.

WEBSITES

- *British Council LearnEnglish*. British Council, https://learnenglish.britishcouncil.org/.
- *Poetry Foundation*. Poetry Foundation, https://www.poetryfoundation.org/.

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand grammar concepts including voice, speech, sentence structure, and composition skills.	K1

CO2	Apply reading and writing skills through prose comprehension and reflective writing tasks.	K2
CO3	Analyze poetry to interpret themes, emotions, and contextual meanings.	K4
CO4	Evaluate short stories by examining characters, themes, and narrative techniques.	K5
CO5	Apply communication and literary skills through one-act plays including dialogue, role play, and interpretation.	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	3	2	-	-	3	2	2	2	-	-	3
CO2	3	2	-	-	3	2	2	3	-	-	3
CO3	3	2	-	-	3	3	3	2	-	-	2
CO4	3	2	-	-	2	3	3	3	-	-	2
CO5	3	2	-	-	2	2	2	3	-	-	2
AVG	3.0	2.0	-	-	2.6	2.4	2.4	2.6	-	-	2.4

26CBDS21	RELATIONAL DATABASE MANAGEMENT SYSTEMS	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To understand the fundamental concepts of data structures and algorithms.
- To learn the relational model and the structure of relational databases.
- To develop skills in using SQL for creating, managing, and querying databases.
- To understand and apply normalization techniques to design efficient databases.

UNIT I	INTRODUCTION TO DATABASE	9 Hours

Definition of Data, Database, and DBMS, Overview of Database Applications, Advantages and Disadvantages of DBMS, Roles of Database Users and Administrators. Introduction to Data Models, Types of Data Models (Hierarchical, Network, Relational, Object-oriented), Importance of Data Models in DBMS

UNIT II	DATABASE DESIGN & ER MODEL	9 Hours

Keys: Primary Key, Candidate Key, Super Key, Foreign Key, Composite Key, Alternate Key, Unique Key, Surrogate Key, Constraints in a table: Primary Key, Foreign Key Unique Key, NOT NULL, CHECK, Entity-Relationship (ER) Model, Entities and Entity Sets, Attributes and Relationships, ER Diagrams, Key Constraints and Weak Entity Sets. Relational Algebra and Calculus: Introduction to Relational Algebra, Operations: Selection, Projection, Set Operations, Join Operations, Division,Tuple

UNIT III	SQL	9 Hours

Structured Query Language (SQL): SQL Basics: DDL and DML, Aggregate Functions (Min(), Max(), Sum(), Avg(), Count()), Logical operators (AND, OR, NOT), Predicates (Like, Between, Alias, Distinct), Clauses(Group By, Having, Order by, top/limit), Inner Join, Natural Join, Full Outer Join, Left Outer Join, Right outer Join, Equi Join

UNIT IV	NORMALIZATION	9 Hours

Functional Dependencies: Armstrong's Axioms, Definition, Properties (Reflexivity, Augmentation, Transitivity), Types (Trivial, Non-Trivial, Partial and Full Functional Dependency), Closure of Functional Dependencies, Normal Forms (1NF, 2NF, 3NF, BCNF), Denormalization.

UNIT V	TRANSACTION MANAGEMENT	9 Hours

Transaction Management: ACID Properties, Transactions and Schedules, Concurrent Execution of Transactions, Lock-Based Concurrency Control, Performance of Locking, Serializability, and Recoverability, Introduction to Lock Management, Dealing with Deadlock

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS:

1. Silberschatz, A., Korth, H. F., & Sudarshan, S. (2021). Database system concepts (7th ed.). McGraw-Hill Education.
2. Hoffer, J. A., Venkataraman, R., Topi, H., & Bala, H. (2025). Modern database management (14th ed.). Pearson Education.
3. Coronel, C., & Morris, S. (2023). Database systems: Design, implementation, and management (14th ed.). Cengage Learning.

REFERENCE BOOKS:

1. Gillenson, M. L., Singh, P., & Pandey, S. (2025). Fundamentals of database management systems (3rd Indian adaptation ed.). Wiley India Pvt. Ltd.
2. Kroenke, D. M., Auer, D. J., Vandenberg, S. L., & Yoder, R. C. (2021). Database concepts (9th ed.). Pearson Education.
3. Ramakrishnan, R., & Gehrke, J. (2021). Database management systems (3rd ed.). McGraw-Hill Education.

WEBSITES:

1. https://www.w3schools.com/sql
2. https://www.tutorialspoint.com/dbms/
3. https://www.geeksforgeeks.org/dbms/

WEB SOURCES:

1. https://www.geeksforgeeks.org/dbms/?utm_source=chatgpt.com
2. https://www.tutorialspoint.com/dbms/index.htm?utm_source=chatgpt.com
3. https://www.w3schools.com/sql/?utm_source=chatgpt.com

NPTEL LINKS:

4. https://nptel.ac.in/courses/106105175?utm_source=chatgpt.com

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand the fundamental concepts of databases, DBMS architecture, data models, and the roles of database users and administrators in modern information systems.	K2
CO2	Design database schemas using Entity Relationship (ER) modeling techniques, keys, constraints, and relational algebra for efficient data organization and management.	K3
CO3	Apply Structured Query Language (SQL) commands and advanced query operations to create, manipulate, retrieve, and manage relational databases effectively.	K3
CO4	Understand relational database schemas, functional dependencies, and normal forms for reducing redundancy and improving database integrity.	K2
CO5	Understand transaction management techniques, concurrency control mechanisms, serializability, and recovery methods to maintain database consistency, reliability, and security in multi-user environments.	K2

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	3	3	-
CO2	3	-	3	-	-	-	-	-	2	3	-
CO3	3	3	-	-	-	-	-	-	2	3	-
CO4	3	-	-	-	-	-	-	-	3	3	-
CO5	3	3	-	-	-	-	-	-	3	3	-
AVG	3	3	3	-	-	-	-	-	2.6	3	-

26CBDS22	DATA STRUCTURES & ALGORITHMS	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To understand the fundamental concepts of data structures and algorithms.
- To learn different linear and non-linear data structures.
- To develop skills to implement searching and sorting algorithms.
- To analyse algorithm efficiency using time and space complexity.

UNIT I	INTRODUCTION TO DATA STRUCTURES	9 Hours

Introduction to data structures – Data types – Abstract data types – Algorithm definition and characteristics – Algorithm design principles – Time complexity – Space complexity – Asymptotic notations (Big-O, Omega, Theta) – Applications of data structures – Basic problem-solving using algorithms.

UNIT II	ARRAYS, SEARCHING AND SORTING	9 Hours

Arrays and representation – Operations on arrays – Sparse matrices – Applications of arrays – Introduction to searching – Linear search – Binary search – Introduction to sorting – Bubble sort – Selection sort – Insertion sort – Comparison of sorting techniques.

UNIT III	STACK AND QUEUE	9 Hours

Introduction to stack – Stack representation using arrays – Stack operations (push, pop, peek) – Applications of stack – Expression conversion (infix to postfix) – Queue introduction – Queue representation using arrays – Queue operations (enqueue, dequeue) – Circular queue – Priority queue.

UNIT IV	LINKED LISTS	9 Hours

Introduction to linked lists – Representation of linked list – Traversal of linked list – Insertion in singly linked list – Deletion in singly linked list – Doubly linked list – Operations in doubly linked list – Circular linked list – Operations in circular linked list – Applications of linked list..

UNIT V	TREES AND GRAPHS	9 Hours

Introduction to trees – Tree terminology – Binary trees – Representation of binary tree – Binary tree traversal (inorder, preorder, postorder) – Binary search tree – Insertion in binary search tree – Heap – Introduction to graphs – Graph representation – Graph traversal (BFS and DFS) – Applications of graphs.

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS:

1. Udit Agarwal, *Data Structures Using C*, S.K. Kataria & Sons, **5th Edition (2024, Reprint 2025)**. ISBN: 978-93-5014-056-7.
2. K. Sharma, *Data Structures Using C*, Pearson Education, **2nd Edition (2024)**. ISBN: 978-1-29983-158-2.
3. Ashok N. Kamthane, *Data Structures Using C*, Pearson Education, **Latest Edition (2024)**. ISBN: 978-1-29944-480-5.

REFERENCE BOOKS:

1. Shaik Fairooz, V. Ramu, R. Pavithra, Ronak P. Joshi, T. Prabakaran, Data Structures Using C, Quill Tech Publications, 1st Edition (2024). ISBN: 978-93-6786-554-5.
2. Robert Sedgewick, Algorithms in C (Parts 1–4): Fundamentals, Data Structures, Sorting, Searching, Addison-Wesley, 3rd Edition (Updated Reprint 2020). ISBN: 978-0-201-31452-6.
3. Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, Fundamentals of Data Structures in C++, Universities Press, 2nd Edition (Reprint 2020). ISBN: 978-81-7371-607-2.

WEBSITES:

1. https://www.w3schools.com/sql
2. https://www.tutorialspoint.com/dbms/
3. https://www.geeksforgeeks.org/dbms/

WEB SOURCES

1. GeeksforGeeks – https://www.geeksforgeeks.org/data-structures/
2. TutorialsPoint Data Structures - https://www.tutorialspoint.com/data_structures_algorithms/
3. JavaTpoint Data Structure Tutorial – https://www.javatpoint.com/data-structure-**tutorial**

NPTEL LINK

https://nptel.ac.in/courses/106102064?utm_source=chatgpt.com

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand the fundamental concepts of data structures, algorithms, abstract data types, and complexity analysis used in problem solving.	K2
CO2	Apply array operations, searching techniques such as linear and binary search, and sorting algorithms including bubble sort, selection sort, and insertion sort for efficient data organization and processing.	K3
CO3	Apply stack and queue operations for solving computational problems such as expression conversion and scheduling applications.	K3
CO4	Understand the concepts and operations of singly linked lists, doubly linked lists, and circular linked lists including traversal, insertion, deletion, and their applications in dynamic memory management.	K2
CO5	Apply tree and graph data structures, binary tree traversals, binary search tree operations, heap concepts, and graph traversal techniques such as BFS and DFS to solve hierarchical and network-based problems effectively.	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	3	3	-
CO2	3	-	3	-	-	-	-	-	2	-	-
CO3	3		3	-	-	-	-	-	2	-	-
CO4	3	-	-	-	-	-	-	-	3	3	-
CO5	3	3	-	-	-	-	-	-	3	3	-
AVG	3	3	3	-	-	-	-	-	2.6	3	-

26BMA002	MATHEMATICS-II	L	T	P	SL	C
		3	0	0	3	3

Course Objectives:

- To enable professional undergraduate students to understand the importance of Mathematics
- To provide basic knowledge of Discrete Mathematics and Probability.
- The main aim of this course is to help the students to read, classify and then interpret the data given to them and draw conclusions.
- Students understand the concepts like Logic, tautology and Probability.

UNIT I	Fundamentals of logic	9 hours

Fundamentals of logic: Introduction to logic, propositional logic, logical connectives and truth table, negation conjunction, disjunction.

UNIT II	Logic and tatology	9 hours

Conditional, bi-conditional or double implication, converse, inverse and contra positive, tautology and contradiction.

UNIT III	Permutations and combinations	9 hours

Introduction - Fundamental Principle of Counting - Permutations: Problems on permutations – Combinations - Problems on combinations, Difference between permutations and combinations.

UNIT IV	Basics of probability	9 hours

Basics of probability: Basic Probability- Axioms of Probability- Addition and Multiplication theorem without proof-Conditional Probability-simple problems

UNIT V	Random variables	9 hours

Random variable - Discrete random variables- Mean- Expectations- Variance- Independent random variables- simple problems, Continuous random variables- Mean- Expectations- Variance- simple problems.

Total : 45 Hours

Self Learning : 45 Hours

TEXT BOOKS

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, McGraw Hill.
2. R A Johnson And C.B.Gupta., Probability and statistics for engineers (Erwin Miller And John E.Freund), 7th edition, Pearson Education / PHI.

REFERENCE BOOKS

1. R. P. Grimaldi (2007), "Discrete and Combinatorial Mathematics", Pearson Education, Fifth Edition
2. Thomas Koshy (2005), "Discrete Mathematics with Applications", Academic Press
3. S.I.Resnick (1999), A Probability Path, Birhauser, Berlin

WEB LINKS

1. https://courses.umass.edu/phil110-gmh/text/c01.pdf
2. https://www.cuemath.com/data/permutations-and-combinations/
3. https://www.toppr.com/guides/maths/probability/introduction-to-probability/

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand the fundamentals of logic including propositions, logical connectives, and truth tables.	K1
CO2	Explain conditional statements, biconditional logic, tautology, and contradiction in logical reasoning.	K2
CO3	Apply principles of permutations and combinations to solve counting problems.	K3
CO4	Analyze basic probability concepts including axioms, conditional probability, and probability theorems.	K4
CO5	Evaluate random variables including mean, expectation, variance, and their applications in problems.	K5

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	3	2	2	–	2	3	2	–	–	–	3
CO2	3	2	2	–	2	3	2	–	–	–	3
CO3	3	3	3	–	2	3	2	2	–	–	3
CO4	3	3	3	–	2	2	2	2	–	–	2
CO5	3	3	3	–	2	3	2	2	–	–	3
AVG	3.0	2.6	2.6	–	2.0	2.8	2.0	0.8	–	–	2.8

26CBDS23	PYTHON FOR DATA SCIENCE	L	T	P	SL	C
		3	0	0	3	3

COURSE OBJECTIVES

- To understand the fundamentals of Python programming.
- To learn control structures, functions, and modules in Python.
- To use Python data structures for data handling.
- To apply Python libraries for basic data science tasks

UNIT I	INTRODUCTION TO PYTHON	9 Hours

Introduction to Python – Features of Python – Installation and Python environment – Python syntax and structure – Variables and data types – Operators in Python – Input and output functions – Type conversion – Basic Python program examples.

UNIT II	CONTROL STRUCTURES	9 Hours

Conditional statements (if, if-else, elif) – Nested if statements – Looping statements – for loop – while loop – break statement – continue statement – pass statement – Range function.

UNIT III	FUNCTIONS AND MODULES	9 Hours

Introduction to functions – Defining and calling functions – Function arguments – Return statements – Recursive functions – Lambda functions – Built-in functions – Modules in Python – Importing modules.

UNIT IV	PYTHON DATA STRUCTURES	9 Hours

Lists and list operations – Tuples and tuple operations – Sets in Python – Dictionaries and operations – List comprehension – Nested data structures – String operations – File handling basics – Reading and writing files.

UNIT V	PYTHON FOR DATA SCIENCE	9 Hours

Introduction to data science – Python libraries for data science – Basics of Spyder – NumPy basics – NumPy arrays – Introduction to Pandas – Pandas Series – Pandas DataFrame – Introduction to data visualization.

Total: 45 Hours

Self-Learning: 45 Hours

TEXT BOOKS:

1. Lubanovic, B. (2025). Introducing Python: Modern computing in simple packages (3rd ed.). O'Reilly Media.
2. Muddana, A. L., & Vinayakam, S. (2025). Python for data science. Ane Books Pvt. Ltd.
3. McKinney, W. (2022). Python for data analysis: Data wrangling with pandas, NumPy, and Jupyter (3rd ed.). O'Reilly Media.
4. VanderPlas, J. (2023). Python data science handbook: Essential tools for working with data (2nd ed.). O'Reilly Media.

REFERENCE BOOKS:

1. Raschka, S., & Mirjalili, V. (2022). Python machine learning: Machine learning and deep learning with Python, scikit-learn, and TensorFlow (3rd ed.). Packt Publishing.
2. Géron, A. (2023). Hands-on machine learning with Scikit-Learn, Keras, and TensorFlow (3rd ed.). O'Reilly Media.
3. George, N. (2023). Practical data science with Python: Learn tools and techniques from hands-on examples to build real-world data science applications. Packt Publishing.

WEBSITES:

1. https://www.python.org
2. https://www.w3schools.com/python/
3. https://www.geeksforgeeks.org/python-programming-language/

WEB SOURCES

1. Python Official Documentation – https://www.python.org/doc/
2. W3Schools Python Tutorial – https://www.w3schools.com/python/
3. GeeksforGeeks Python Programming – https://www.geeksforgeeks.org/python- Programming-language/

NPTEL LINKS

1. https://nptel.ac.in/courses/106106212?utm_source=chatgpt.com
2. https://nptel.ac.in/courses/106104220?utm_source=chatgpt.com

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand the fundamental concepts of Python programming including syntax, variables, data types, operators, input/output functions, and basic program development.	K2
CO2	Apply conditional statements, looping constructs, and control transfer statements to develop Python programs for solving computational problems.	K3
CO3	Apply functions, recursive techniques, lambda expressions, and modules to develop modular and reusable Python applications.	K3
CO4	Understand Python data structures such as lists, tuples, sets, dictionaries, string operations, and file handling techniques for efficient data management.	K2
CO5	Apply Python libraries including NumPy and Pandas for basic data science operations, data manipulation, and data visualization.	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	3	3	-
CO2	3	-	3	-	-	-	-	-	2	3	-
CO3	3	3	3	-	-	-	-	-	2	3	-
CO4	3	3	3	-	-	-	-	-	3	3	-
CO5	3	-	-	3	-	-	-	-	3	3	-
AVG	3	3	3	3	-	-	-	-	2.6	3	-

26PBDS22	DATA STRUCTURES USING PYTHON LAB	L	T	P	SL	C
		0	0	2	2	1

COURSE OBJECTIVES

- To understand the practical implementation of data structures using Python.
- To develop programs for linear data structures such as stacks, queues, and linked lists
- To implement searching and sorting algorithms using Python.
- To analyze and apply data structures for solving computational problems.

LIST OF EXPERIMENTS: **15 Hours**

1. Write a Python program to implement array operations (insertion, deletion, traversal).
2. Write a Python program to implement stack operations using list.
3. Write a Python program to implement queue operations.
4. Write a Python program to implement circular queue.
5. Write a Python program to implement singly linked list operations.
6. Write a Python program to implement doubly linked list.
7. Write a Python program to perform binary search.
8. Write a Python program to perform linear search.
9. Write a Python program to implement bubble sort.
10. Write a Python program to implement selection sort.
11. Write a Python program to implement insertion sort.
12. Write a Python program to implement basic tree traversal (inorder, preorder, postorder).

Total: 15 Hours
Self Learning:15 Hours

TEXT BOOKS:

1. Dr. S. Rasheed Mansoor Ali, Python Programming Lab Manual for Beginners: A Hands-On Approach, SK Research Group, **1st Edition (2025)**.

2. Laboratory Manual for Basic Python Programming (MSBTE K Scheme), Brilliant Publications, **1st Edition (2024)**.

3. J. B. Patel, Laboratory Manual for Python Programming (GTU Diploma Engineering), Atul Publications, **Revised Edition (2022)**.

REFERENCE BOOKS:

1. Reema Thareja, Data Structures Using Python, Oxford University Press, 2019. ISBN: 978-0-19-948017-3.

2. Rance D. Necaise, Data Structures and Algorithms Using Python, Wiley India, 2011. ISBN: 978-8126534042.

3. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, Data Structures and Algorithms in Python, Wiley, 2013. ISBN: 978-1118290279.

WEBLINKS:

1.https://www.geeksforgeeks.org/data-structures/
2.https://www.tutorialspoint.com/python_data_structure/index.htm

COURSE OUTCOMES:

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

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Apply Python programming constructs and built-in data structures to implement fundamental linear data structures such as arrays, stacks, queues, and linked lists for solving computational problems.	K3
CO2	Develop Python programs to perform core data structure operations including insertion, deletion, traversal, searching, and manipulation of data elements efficiently.	K3
CO3	Analyze the working principles and performance characteristics of searching and sorting algorithms, and implement suitable techniques for different problem scenarios.	K4
CO4	Construct and demonstrate hierarchical data structures such as trees and perform standard traversal techniques including inorder, preorder, and postorder operations.	K3
CO5	Design, test, and evaluate Python-based solutions using appropriate data structures and algorithms to address real-world computational and data-processing requirements..	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	P O4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2	PSO3
CO1	3	2	-	2	-	-	-	-	-	2	-	-
CO2	-	2	3	2	-	-	-	-	-	3	-	-
CO3	-	3	3	3	-	-	-	-	-	2	-	-
CO4	-	3	3	3	-	-	-	-	-	3	-	-
CO5	-	3	3	3	-	-	-	-	-	3	-	-
AVG	3	2.6	-	2.6	-	-	-	-	-	2.6	-	-

26PBDS21	RELATIONAL DATABASE MANAGEMENT LAB	L	T	P	SL	C
		0	0	2	2	1

COURSE OBJECTIVES

- To understand the practical implementation of data structures using Python.
- To develop programs for linear data structures such as stacks, queues, and linked lists
- To implement searching and sorting algorithms using Python.
- To analyze and apply data structures for solving computational problems.

	LIST OF EXPERIMENTS:	15 Hours

1. Create tables with appropriate data types.
2. Insert,Update ,Delete and Retrieve records using the **SELECT** statement.
3. Retrieve records using **WHERE** conditions.
4. Display records using **ORDER BY** clause.
5. Display grouped data using **GROUP BY** clause.
6. Filter grouped data using **HAVING** clause.
7. Apply aggregate functions (**COUNT, SUM, AVG, MAX, MIN**).
8. Demonstrate **INNER JOIN,LEFT JOIN AND RIGHT JOIN** between two tables.
9. Perform queries using **subqueries**.
10. Create and use **views**.
11. Implement **PRIMARY KEY, FOREIGN KEY, and UNIQUE** constraints.
12. Create **indexes** to improve query performance.
13. Demonstrate **normalization concepts (1NF, 2NF, 3NF)**.
14. Demonstrate **transaction control commands (COMMIT, ROLLBACK, SAVE POINT)**.
15. Create and execute **stored procedures**.
16. Create and demonstrate **triggers** for automatic database actions

Total: 15 Hours
Self Learning: 15 Hours

TEXT BOOKS:

1. Silberschatz, A., Korth, H. F., & Sudarshan, S. (2021). Database system concepts (7th ed.). McGraw-Hill Education.
2. Hoffer, J. A., Venkataraman, R., Topi, H., & Bala, H. (2025). Modern database management (14th ed.). Pearson Education.
3. Coronel, C., & Morris, S. (2023). Database systems: Design, implementation, and management (14th ed.). Cengage Learning.

REFERENCE BOOKS:

1. Gillenson, M. L., Singh, P., & Pandey, S. (2025). Fundamentals of database management systems (3rd Indian adaptation ed.). Wiley India Pvt. Ltd.
2. Kroenke, D. M., Auer, D. J., Vandenberg, S. L., & Yoder, R. C. (2021). Database concepts (9th ed.). Pearson Education.
3. Ramakrishnan, R., & Gehrke, J. (2021). Database management systems (3rd ed.). McGraw-Hill Education.

WEBLINKS:

1. https://www.w3schools.com/sql
2. https://www.geeksforgeeks.org/sql/sql-tutorial/
3. https://www.simplilearn.com/tutorials/dbms-tutorial

COURSE OUTCOMES:

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

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Apply SQL commands to create database tables, insert, update, delete, and retrieve records using various SQL statements and clauses.	K3
CO2	Apply SQL query techniques including WHERE, ORDER BY, GROUP BY, HAVING, aggregate functions, and subqueries for efficient data retrieval and analysis.	K3
CO3	Implement joins, views, indexes, and database constraints to establish relationships and improve database integrity and query	K3
CO4	Apply normalization techniques and relational database concepts to organize data efficiently and minimize redundancy.	K3
CO5	Implement transaction control commands, stored procedures, and triggers to manage database transactions and automate database operations effectively.	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	P O4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2	PSO3
CO1	3	3	-	2	-	-	-	-	-	2	-	-
CO2	3	3	-	2	-	-	-	-	-	3	-	-
CO3	3	3	3	3	-	-	-	-	-	2	-	-
CO4	3	3	-	3	-	-	-	-	-	3	-	-
CO5	3	3	3	3	-	-	-	-	-	3	-	-
AVG	3	3	3	2.6	-	-	-	-	-	2.6	-	-

26DVAC21	UNIVERSAL HUMAN VALUES	L	T	P	SL	C
		1	0	0	1	1

COURSE OBJECTIVES

The candidates will be able to appreciate the complementarity between the values and skills for sustained happiness and prosperity. To influence the students to approach the life and profession with a holistic perspective towards a value-based living in a natural way. To highlight plausible implications of holistic understanding of ethical human conduct.

UNIT I	INTRODUCTION TO VALUE EDUCATION	5 Hours

Living a fulfilling life. Value education. Skill education. Complementarity of Values and Skills. Development of a holistic perspective. Right understanding, relationship and physical facility. Understanding the happiness and prosperity.

UNIT II	HARMONY AT MULTIPLE LEVELS	5 Hours

Human being as co-existence of the self and the human body. Understanding harmony in the self. Harmony in the family and understanding values in human-human relationships. Harmony in the society and understanding universal human order. Harmony in nature and understanding the interconnectedness, self-regulation and mutual fulfilment. Harmony in existence and understanding co-existence at various levels.

UNIT III	IMPLICATIONS OF THE RIGHT UNDERSTANDING	5 Hours

Ethical human conduct. Implications of value-based living. Right understanding of professional ethics. Humanistic education. Holistic technologies, production systems and management models. Strategies for transition towards value-based life and profession.

Total: 15 Hours

Self-Learning: 15 Hours

TEXT BOOKS:

1. R.R. Gaur, R. Asthana, G.P. Bagaria. (2023). A Foundation Course in Human Values and Professional Ethics. 3PPRD Revised Edition. Excel Books, New Delhi.

REFERENCE BOOK:

1. A. Nagaraj, Jeevan Vidya Prakashan, Amar Kantak. Jeevan Vidya (1999), Ek Parichaya
2. Rakesh Gupta. Jeevan Vidya (2008), An Introduction (Introductory Book to Madhyasth Darshan-Coexistentialism). English Version.
3. A. N. Tripathi (2004), Human Values. First Edition. New Age International Publishers, New Delhi.

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand the basics of value education, skill education, and the concept of happiness and prosperity in life.	K1
CO2	Explain harmony at multiple levels including self, family, society, nature, and co-existence.	K2
CO3	Apply right understanding in ethical human conduct and value-based living in daily life.	K3
CO4	Analyze human relationships, societal harmony, and interconnectedness in nature and existence.	K4
CO5	Evaluate ethical practices, professional values, and strategies for value-based life and profession.	K5

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	P O4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	3	3	2	3	-	-	-
CO2	-	-	-	-	-	3	-	3	3	-	-	-
CO3	-	-	-	-	-	3	-	2	3	-	-	-
CO4	-	-	-	-	-	3	-	2	3	-	-	-
CO5	-	-	-	-	-	3	-	2	3	-	-	-
AVG	-	-	-	-	-	3	3	2.2	3	-	-	-

26PSSK12	COMMUNICATION SKILLS	L	T	P	SL	C
		0	0	4	4	2

Course Objectives:

- To improve speaking and presentation skills.
- To build reading and writing skills for academic and professional use.
- To prepare students for job communication (resume, GD, interview)

UNIT I	Fundamentals of Communication & Basic LSRW Skills	6 hours

- **Listening:** Listening for specific information (MCQs)
- **Speaking:** Self-introduction; talking about likes and dislikes; greetings
- **Reading:** Skimming, scanning, and detailed comprehension
- **Writing:** Formal letters (job application), resume basics, problem–solution writing

Language Lab / Practical:

- Digital literacy: E- resources
- Practice: Self-introduction, JAM (Just a Minute)

UNIT II	Listening & Speaking Strategies in Context	6 hours

- **Listening:** Conversations, advertisements, small talks, TED talks, summarizing,
- **Speaking:** Impromptu talks, speech writing, mini-presentations, AI-based speaking and Pronunciation tools
- **Reading:** Identifying arguments and main ideas in texts
- **Writing:** Writing Instruction, Checklist Preparation, Paragraph writing,

Language Lab / Practical:

- Blog creation, online quizzes, and Kahoot activities
- Practice: Conversation Drills, Prompting Conversation

Listening: Note-taking from audio/text recitation

Speaking: Discussion on fear, society, and behaviour

Reading: Skimming, scanning, and interpretation of textual features

Writing: Reflective paragraph writing

UNIT III	Reading, Technical Writing & Analytical Skills	6 hours

- **Listening:** Listening to debates/Academic discussions and extracting key points
- **Speaking:** Participating in group discussions, AI for Presentation using prompts
- **Reading:** Extracting specific information; note-making
- **Writing:** Framing open-ended /closed ended questions, sequencing sentences, Report writing, and précis writing

Language Lab / Practical:

- PowerPoint presentations, Slide Share tools
- Practice: Reading comprehension, report writing, statement of purpose

UNIT IV	Critical Thinking & Presentation	6 hours

- **Listening:** Understanding instructions, interpretations & recommendations
- **Speaking:** Formal presentations, public speaking
- **Reading:** Classification and interpretation of information
- **Writing:** Instructions, recommendations, user manuals

Language Lab / Practical:

- Online discussion forums and collaborative tools
- Practice: Book/film review, presentation delivery.

UNIT V	Professional & Workplace Communication	6 hours

- **Listening:** Workplace communication.
- **Speaking:** Group discussions, interviews, persuasive communication, negotiation
- **Reading:** Professional documents and job-related texts
- **Writing:** Cover letters, resumes, formal emails, Process Descriptions

Language Lab / Practical:

- Digital tools for communication and presentations
- Practice: Mock interviews, GDs

Total: 30 Hours

Self-Learning: 30 Hours

TEXT BOOKS

1. Kumar, Sanjay, and Pushp Lata. *Communication Skills*. Pearson Education, 2018.
2. Bovée, Courtland L., and John V. Thill. *Business Communication Today*. 14th ed., Pearson, 2020.
3. Raman, Meenakshi, and Sangeeta Sharma. *Technical Communication: Principles and Practice*. 3rd ed., Oxford University Press, 2015.
4. Kumar, Kulbhushan. *Effective Communication Skills*. Khanna Publishing House, 2018.
5. Mohan, Krishna, and Meera Banerji. *Developing Communication Skills*. 2nd ed.,

Macmillan Education, 2018.

REFERENCE BOOKS

1. Sharma, R. C., and Krishna Mohan. Business Correspondence and Report Writing: A Practical Approach to Business and Technical Communication. 5th ed., McGraw-Hill Education, 2017.
2. Mitra, Barun K. Personality Development and Soft Skills. 2nd ed., Oxford University Press, 2016.
3. Sasikumar, V., P. Kiranmai Dutt, and Geetha Rajeevan. A Course in Listening and Speaking I. Cambridge University Press, 2005.
4. Murphy, Raymond. English Grammar in Use. 5th ed., Cambridge University Press, 2019.
5. Lewis, Norman. Word Power Made Easy. Revised ed., Goyal Publishers & Distributors, 2014.

WEBSITES

1. Purd Online Writing Lab. “OWL.” *Purdue University*, https://owl.puPPRDue.edu/.
2. TED. “TED Talks.” *TED Conferences*, https://www.ted.com/talks.
3. British Council. *Learn English*. British Council ,https://learnenglish.britishcouncil.org/

COURSE OUTCOMES

After completion of the course, the student will be able to:

COURSE OUTCOMES	DESCRIPTION	KNOWLEDGE LEVEL
CO1	Understand basic communication skills including listening, speaking, reading, and writing fundamentals.	K1
CO2	Apply listening and speaking strategies in real-life and academic communication contexts.	K2
CO3	Analyze reading and writing skills for technical communication, reports, and academic tasks.	K4
CO4	Evaluate critical thinking and presentation skills for effective communication and interpretation.	K5
CO5	Apply professional communication skills including interviews, group discussions, and workplace writing.	K3

CO PO ARTICULATION MATRIX

	PO1	PO2	PO3	P O4	PO5	PO6	PO7	PO 8	PO9	PSO1	PSO2	PSO3
CO1	-	2	-	2	-	3	2	2	-	2	-	-
CO2	-	2	-	2	-	3	2	3	-	2	-	-
CO3	-	3	-	3	-	3	2	3	-	2	-	-
CO4	-	3	-	3	-	3	2	3	-	2	-	-
CO5	-	3	-	3	-	3	2	3	-	3	-	-
AVG	-	2.6	-	2.6	-	3.0	2.0	2.8	-	2.2	-	-