INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)
(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)
PALLAVARAM - CHENNAI
ACCREDITED BY NAAC WITH 'A' GRADE
Marching Beyond 30 Years Successfully
INSTITUTION WITH UGC 12B STATUS

UNDERGRADUATE DEGREE PROGRAMME

B.Sc., Computer Science

Three Years

/

B.Sc., (Hons) Computer Science

Four Years

CURRICULUM & SYLLABUS

REGULATION 2024

Choice Based Credit System (CBCS)

&

Learning Outcomes Based Curriculum Framework (LOCF)

Effective from the Academic Year

2024 -2025

Department of Computer Science

School of Computing Sciences

DEPARTMENT OF COMPUTER SCIENCE

VISION OF THE DEPARTMENT
Aims to provide quality education in the field of Computer Science with state of art facilities and handle quality research in association with industry and other Universities to produce well trained IT professionals in Computer Science domain.

MISSION OF THE DEPARTMENT	
M1	To provide knowledge through teaching and training in the field of Computer Science.
M2	To concentrate on teaching-learning, research, project and consultancy help to increase the growth of IT and IT Enabled Services.
M3	To train students to get best opportunities and tackle challenges in IT industry.
M4	To equip students with communication skill, Leadership quality, ability to work with team help to improve the society.
M5	To provide value based and technical oriented related students help to build the nation.

PROGRAMME EDUCATIONAL OUTCOMES (PEO)	
PEO1	Graduates are prepared to be employed in IT industries by providing expected Domain Knowledge.
PEO2	Graduates are provided with practical training, hands-on and project experience to meet the industrial needs.
PEO3	Graduates are motivated in career and entrepreneurial skill development to become global leaders.
PEO4	Graduates are trained to demonstrate creativity, develop innovative ideas and to work in teams to accomplish a common goal.
PEO5	Graduates are addressed with social issues and guided to operate problems with Solution.

PROGRAMME OUTCOMES (PO)	
PO1	**Critical Thinking:** Apply knowledge of Computer Science to identify, analyse problems and to provide effective solution in the area of Computing.
PO2	**Computing Skills:** Analyze a problem, identify and define the computing requirements appropriate to its solution.
PO3	**Analytical skills:** Ability to design, develop algorithms and provide software solutions to cater the industrial needs.
PO4	**Modern Tool Usage:** Use current techniques, skills, and tools necessary for computing practices
PO5	**Employability Skills:** Inculcate skills to excel in the fields of Information Technology and its Enabled services, Government and Private sectors, Teaching and Research.
PO6	**Ethics:** Insists ethical responsibilities, human and professional values and make their contribution to the society.
PO7	**Self Directed and Life-long Learning:** Engaged in lifelong learning to equip them to the changing environment and be prepared to take-up mastering programmes.
PO8	**Individual and Team Work:** Function effectively as an individual, and as a member or a leader in diverse team and multidisciplinary settings.
PO9	**Project Management and Finance:** Demonstrate knowledge and understanding of the problem and management principles and apply these to one's own work, as a member and engineering and management principles and apply these to one's own work, as a member.

PROGRAMME SPECIFIC OUTCOMES (PSO)	
PSO1	Professionally trained in the areas of programming, multimedia, animation, web designing, networking and to acquire knowledge in various domain-based electives.
PSO2	Abet students to communicate effectively and to improve their competency skills to solve real time problems.
PSO3	The ability to employ modern computer languages and applications for their successful career, to create platforms to become an entrepreneur and a relish for higher studies.

BOARD OF STUDIES

List of Members

Department of Computer Science

S. No	Name & Designation	Address	Role
1.	Dr. P. Magesh Kumar	Director, School of Computing Sciences	Chairperson
2.	Dr. R. Ganesan	Professor and Dean, School of CSE, VIT, Chennai Campus, Vandalur, Kelambakkam Main Road, Chennai-600127	Academic Expert (External Member)
3.	Mr.R.Rajkumar	Program Manager, Birla Soft, Prince Infocity Chennai	Industrial Expert (External Member)
4.	Dr. R. Parameswari	Professor and Head, Department of Computer Science, VISTAS	Internal Member
5.	Dr. S. Perumal	Professor, Department of Computer Science, VISTAS	Internal Member
6.	Dr. G. Thailambal	Associate Professor, Department of Computer Science, VISTAS	Internal Member
7.	Dr. S. Mangaiyarkarasi	Associate Professor, Department of Computer Science, VISTAS	Internal Member
8.	Mr. R. Balamurugan	Assistant Professor, Department of Computer Science, VISTAS	Internal Member
9.	Ms. R. Padma	Assistant Professor, Department of Computer Science, VISTAS	Internal Member
10.	Mr. K. Thirumurugan	Milestone Internet Marketing Private Limited, Team Lead-DX, Chennai	Alumni Member (External Member)

CREDIT DISTRIBUTION

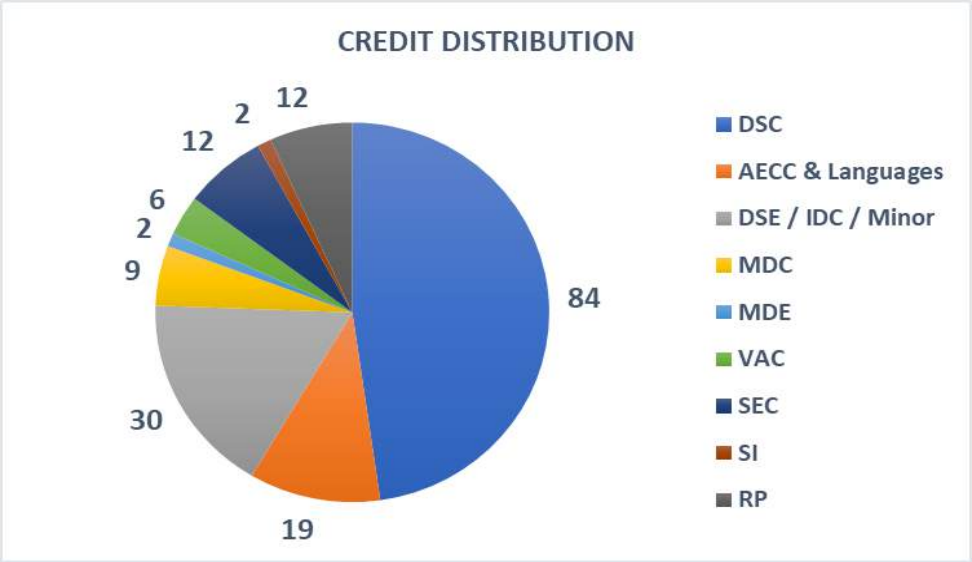
B.Sc., (Hons) Computer Science

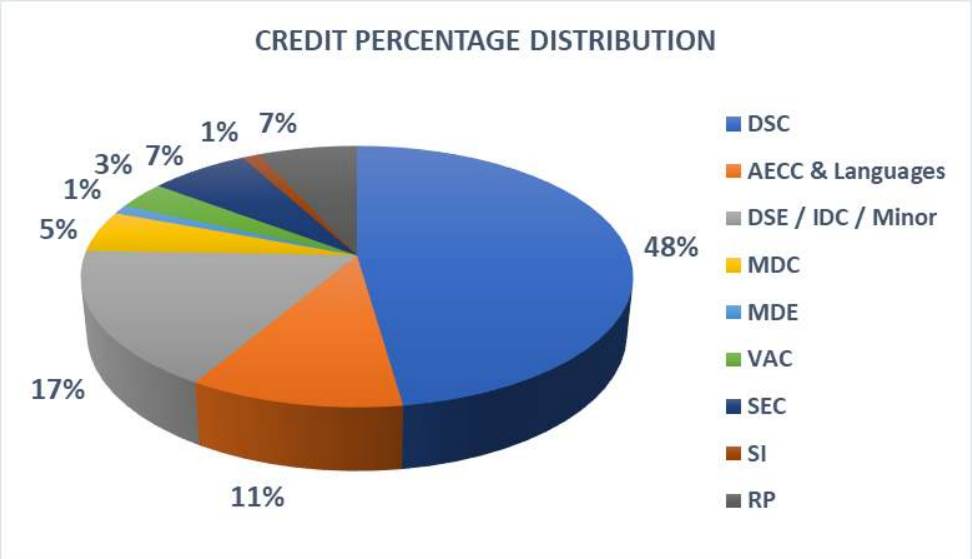
Minimum credits to be earned: 176

B.Sc., Computer Science

Minimum credits to be earned: 132

Component	I Sem	II Sem	III Sem	IV Sem	V Sem	VI Sem	3 Yrs. Total Credits	VII Sem	VIII Sem	4 Yrs Total Credits
DSC	8	8	8	8	12	16	60	12	12	84
AECC & Languages	4	4	4	7	-	-	19	-	-	19
DSE / IDC / Minor	3	4	3	4	4	4	22	4	4	30
MDC	3	3	3	-	-	-	9	-	-	9
MDE	-	-	2	-	-	-	2	-	-	2
VAC	1	2	-	1	2	-	6	-	-	6
SEC	2	2	2	2	2	2	12	-	-	12
SI	-	-	1	-	1	-	2	-	-	2
RP	-	-	-	-	-	-	-	6	6	12
Total Credits	21	23	23	22	21	22	132	22	22	176





ABBREVIATIONS

DSC	Disciplinary Specific Core
AECC	Ability Enhancement Compulsory Courses
DSE	Disciplinary Specific Elective
IDC	Interdisciplinary / Minor Courses
MDC	Multidisciplinary Courses
MDE	Multidisciplinary Elective
VAC	Value Added Courses
SEC	Skill Enhancement Courses
SI	Summer Internship
RP	Research Project

CURRICULUM STRUCTURE

B.Sc., Computer Science Three Years / BSc., (Hons) Computer Science Four Years

Total number of Credits: 176

	B.Sc., Computer Science (Hons) Minimum Credits to be earned :176 B.Sc., Computer Science Minimum Credits to be earned: 132									
	SEMESTER 1									
			Hours/Week					Maximum Marks		
Category	**Code**	**Course**	**L**	**T**	**P**	**O**	**C**	**CIA**	**SEE**	**Total**
LANG 1	24LTAM11/ 24LHIN11/ 24LFRE11	Tamil I / Hindi I/ French I	2	0	0	1	2	40	60	100
ENG 1	24LENG11	English I	2	0	0	1	2	40	60	100
DSC 1	24CBCS11	Problem Solving Approaches Using C	4	0	0	2	4	40	60	100
DSC 2	24CBCS12	Digital Logic Fundamentals	3	0	0	2	3	40	60	100
MDC 1	24BMA001	Mathematics- I	2	1	0	2	3	40	60	100
DSE 1/ IDC 1 / Minor 1	24DBCS1-	Discipline Specific Elective – I	3	0	0	2	3	40	60	100
DSC 1	24PBCS11	Practical I-Problem Solving Approaches Using C Lab	0	0	2	1	1	40	60	100
VAC 1	24DVAC11	Universal Human Values	1	0	0	1	1	40	60	100
SEC 1	24SSKU11	Soft skills - 1	2	0	0	1	2	40	60	100
SEC 2		Orientation programme / Industrial Visit	-	-	-	-	-	-	-	-
			19	**1**	**2**	**-**	**21**	**-**	**-**	**-**

CIA - Continuous Internal Assessment SEE - Semester End Examination

***L – Lecture, *T- Tutorial, *P- Practical, *O - Outside the class effort / self-study**

SEMESTER 2										
			Hours/Week					Maximum Marks		
Category	Code	Course	L	T	P	O	C	CIA	SEE	Total
LANG 2	24LTAM21/ 24LHIN21/ 24LFRE21	Tamil II / Hindi II / French II	2	0	0	1	2	40	60	100
ENG 2	24LENG21	English II	2	0	0	1	2	40	60	100
DSC 3	24CBCS21	Object Oriented Programming Languages	3	0	0	2	3	40	60	100
DSC 4	24CBCS22	Database Management System	3	0	0	2	3	40	60	100
MDC 2	24BMA002	Mathematics – II	2	1	0	2	3	40	60	100
DSE 2 / IDC 2 / Minor 2	24DBCS2-	Discipline Specific Elective - II	4	0	0	2	4	40	60	100
DSC 3	24PBCS21	Practical II- Object Oriented Programming Languages Lab	0	0	2	1	1	40	60	100
DSC 4	24PBCS22	Practical III- RDBMS Lab	0	0	2	1	1	40	60	100
VAC 2	24DVAC21	Communication Skills	2	0	0	1	2	40	60	100
SEC 3	24SSKU21	Soft Skills II	2	0	0	1	2	40	60	100
			20	1	4	-	23	-	-	-

CIA - Continuous Internal Assessment SEE - Semester End Examination

***L – Lecture, *T- Tutorial, *P- Practical, *O - Outside the class effort / self-study**

SEMESTER 3										
			Hours/Week					Maximum Marks		
Category	Code	Course	L	T	P	O	C	CIA	SEE	Total
LANG 3	24LTAM31/ 24LHIN31/ 24LFRE31	Tamil III / Hindi III / French III	2	0	0	1	2	40	60	100
ENG 3	24LENG31	English III	2	0	0	1	2	40	60	100
DSC 5	24CBCS31	Problem Solving Using Python	3	0	0	2	3	40	60	100
DSC 6	24CBCS32	Modern Operating System	3	0	0	2	3	40	60	100
MDC 3	24BMA003	Statistics-I	2	1	0	2	3	40	60	100
DSE 3 / IDC 3 / Minor 3	24DBCS3-	Discipline Specific Elective - III	3	0	0	2	3	40	60	100
DSC 5	24PBCS31	Practical IV - Data Structures Using Python Lab	0	0	2	1	1	40	60	100
DSC 6	24PBCS32	Practical V - Operating System Lab	0	0	2	1	1	40	60	100
MDE 1	24SSKU31	Indian Knowledge System	2	0	0	1	2	40	60	100
SEC 4	24SSKU31	Soft Skills III	2	0	0	1	2	40	60	100
SI 1	24IBCS31	Internship I	0	0	2	1	1	-	100	100
			19	1	6	-	23	-	-	-

CIA - Continuous Internal Assessment SEE - Semester End Examination

***L – Lecture, *T- Tutorial, *P- Practical, *O - Outside the class effort / self-study**

SEMESTER 4										
			Hours/Week					Maximum Marks		
Category	**Code**	**Course**	**L**	**T**	**P**	**O**	**C**	**CIA**	**SEE**	**Total**
LANG 4	24LTAM41/ 24LHIN41/ 24LFRE41	Tamil IV / Hindi IV / French IV	2	0	0	1	2	40	60	100
ENG 4	24LENG41	English IV	2	0	0	1	2	40	60	100
AECC 1	24EVS041	Environmental Studies	3	0	0	2	3	40	60	100
DSC 7	24CBCS41	Advanced Java Programming	3	0	0	2	3	40	60	100
DSC 8	24CBCS42	Computer Graphics	3	0	0	2	3	40	60	100
DSE 4 / IDC 4 / Minor 4	24DBCS4-	Discipline Specific Elective - IV	4	0	0	2	4	40	60	100
DSC 7	24PBCS41	Practical VI - Advanced Java Programming Lab	0	0	2	1	1	40	60	100
DSC 8	24PBCS42	Practical VII - Computer Graphics Lab	0	0	2	1	1	40	60	100
SEC 5	24SBCS41	Industry Oriented Employability skills	1	0	2	1	2	40	60	100
VAC 3	24DVAC41	Yoga Education / NSS / NCC	0	0	2	1	1	-	100	100
SEC 6		In-plant Training/ Industrial Tour/ Summer Term	-	-	-	-	-	-	-	-
			18	**-**	**8**	**-**	**22**	**-**	**-**	**-**

CIA - Continuous Internal Assessment SEE - Semester End Examination

***L – Lecture, *T- Tutorial, *P- Practical, *O - Outside the class effort / self-study**

SEMESTER 5										
			Hours/Week					Maximum Marks		
Category	Code	Course	L	T	P	O	C	CIA	SEE	Total
DSC 9	24CBCS51	Data Communications and Networking	3	0	0	2	3	40	60	100
DSC 10	24CBCS52	Web Development using Angular JS	3	0	0	2	3	40	60	100
DSC 11	24CBCS53	Software Testing	4	0	0	2	4	40	60	100
DSE 5 / IDC 5 / Minor 5	24DBCS5-	Discipline Specific Elective – V	4	0	0	2	4	40	60	100
DSC 9	24PBCS51	Practical VIII - Computer Networks Lab	0	0	2	1	1	40	60	100
DSC 10	24PBCS52	Practical IX - Web Development using Angular JS Lab	0	0	2	1	1	40	60	100
SEC 7	24SBCS51	Entrepreneurial Development	2	0	0	1	2	40	60	100
VAC 4	24DVAC51	Web Designing	2	0	0	1	2	40	60	100
SI 2	24IBCS51	Internship II	0	0	2	1	1	-	100	100
SEC 8		Skill Enhancement Training / Student Club Activities/ Institution Innovation Council Activities	-	-	-	-	-	-	-	-
			18	-	6	-	21	-	-	-

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

***L – Lecture, *T- Tutorial, *P- Practical, *O - Outside the class effort / self-study**

SEMESTER 6										
			Hours/Week					Maximum Marks		
Category	**Code**	**Course**	**L**	**T**	**P**	**O**	**C**	**CIA**	**SEE**	**Total**
DSC 12	24CBCS61	Theory of Computation	3	0	0	2	3	40	60	100
DSC 13	24CBCS62	Programming in R	4	0	0	2	4	40	60	100
DSC 14	24CBCS63	Cloud Computing	4	0	0	2	4	40	60	100
DSC 15	24CBCS64	Introduction to IOT	4	0	0	2	4	40	60	100
DSE 6 / IDC 6 / Minor 6	24DBCS6-	Discipline Specific Elective - VI	4	0	0	2	4	40	60	100
DSC 12	24PBCS61	Practical X - R Programming Lab	0	0	2	1	1	40	60	100
SEC 9	24SBCS61	Mini Project	0	0	4	1	2	-	100	100
SEC 10		On Job Training / Apprenticeship / Startup	-	-	-	-	-	-	-	-
			19	**-**	**6**	**-**	**22**	-	**-**	**-**

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

***L – Lecture, *T- Tutorial, *P- Practical, *O - Outside the class effort / self-study**

SEMESTER 7										
			Hours/Week					Maximum Marks		
Category	Code	Course	L	T	P	O	C	CIA	SEE	Total
DSC 16	24CBCS71	Machine Learning Essentials	3	0	0	2	3	40	60	100
DSC 17	24CBCS72	Image Processing	4	0	0	2	4	40	60	100
DSC 18	24CBCS73	Soft Computing	4	0	0	2	4	40	60	100
DSE 7 / IDC 7 / Minor 7	24DBCS7-	Discipline Specific Elective – VII	4	0	0	2	4	40	60	100
DSC 16	24PBCS71	Practical XI - Machine Learning Lab	0	0	2	1	1	40	60	100
RP 1	24RBCS71	Research Project I	0	0	12	4	6	40	60	100
			15	-	14	-	22	-	-	-

CIA - Continuous Internal Assessment SEE - Semester End Examination

*L – Lecture, *T- Tutorial, *P- Practical, *O - Outside the class effort / self-study

SEMESTER 8										
			Hours/Week					Maximum Marks		
Category	Code	Course	L	T	P	O	C	CIA	SEE	Total
DSC 19	24CBCS81	Big data analytics	3	0	0	2	3	40	60	100
DSC 20	24CBCS82	Mobile computing	3	0	0	2	3	40	60	100
DSC 21	24CBCS83	Research Methodology	4	0	0	2	4	40	60	100
DSE 8 / IDC 8 / Minor 8	24DBCS8-	Discipline Specific Elective – VIII	4	0	0	2	4	40	60	100
DSC 19	24PBCS81	Practical XII - Big data analytics Lab	0	0	2	1	1	40	60	100
DSC 20	24PBCS82	Practical XIII - Android Studio Lab	0	0	2	1	1	40	60	100
RP 2	24RBCS81	Research Project II	0	0	12	4	6	-	60	100
			14	-	16	-	22	-	-	-

CIA - Continuous Internal Assessment SEE - Semester End Examination *L – Lecture, *T- Tutorial, *P- Practical, *O - Outside the class effort / self-study

DISCIPLINARY SPECIFIC CORE COURSES

Category	Code	Course	L	T	P	O	C
DSC 1	24CBCS11	Problem Solving Approaches Using C	4	0	0	2	4
DSC 2	24CBCS12	Digital Logic Fundamentals	3	0	0	2	3
DSC 1 (Lab)	24PBCS11	Problem Solving Approaches Using C Lab	0	0	2	1	1
DSC 3	24CBCS21	Object Oriented Programming Languages	3	0	0	2	3
DSC 4	24CBCS22	Database Management System	3	0	0	2	3
DSC 3 (Lab)	24PBCS21	Object Oriented Programming Languages Lab	0	0	2	1	1
DSC 4 (Lab)	24PBCS22	RDBMS Lab	0	0	2	1	1
DSC 5	24CBCS31	Problem Solving using Python	3	0	0	2	3
DSC 6	24CBCS32	Modern Operating System	3	0	0	2	3
DSC 5 (Lab)	24PBCS31	Data Structures using Python Lab	0	0	2	1	1
DSC 6 (Lab)	24PBCS32	Operating System Lab	0	0	2	1	1
DSC 7	24CBCS41	Advanced Java Programming	3	0	0	2	3
DSC 8	24CBCS42	Computer Graphics	3	0	0	2	3
DSC 7 (Lab)	24PBCS41	Advanced Java Programming Lab	0	0	2	1	1
DSC 8 (Lab)	24PBCS42	Computer Graphics Lab	0	0	2	1	1

DSC 9	24CBCS51	Data Communications and Networking	3	0	0	2	3
DSC 10	24CBCS52	Web Development using Angular JS	3	0	0	2	3
DSC 11	24CBCS53	Software Testing	4	0	0	2	4
DSC 9 (Lab)	24PBCS51	Computer Networks Lab	0	0	2	1	1
DSC 10 (Lab)	24PBCS52	Web Development using Angular JS Lab	0	0	2	1	1
DSC 12	24CBCS61	Theory of Computation	3	0	0	2	3
DSC 13	24CBCS62	Programming in R	4	0	0	2	4
DSC 14	24CBCS63	Cloud Computing	4	0	0	2	4
DSC 15	24CBCS64	Introduction to IOT	4	0	0	2	4
DSC 12 (Lab)	24PBCS61	R Programming Lab	0	0	2	1	1
DSC 16	24CBCS71	Machine Learning Essentials	3	0	0	2	3
DSC 17	24CBCS72	Image Processing	4	0	0	2	4
DSC 18	24CBCS73	Soft Computing	4	0	0	2	4
DSC 16 (Lab)	24PBCS71	Machine Learning Lab	0	0	2	1	1
DSC 19	24CBCS81	Big data analytics	3	0	0	2	3
DSC 20	24CBCS82	Mobile computing	3	0	0	2	3
DSC 21	24CBCS83	Research Methodology	4	0	0	2	4
DSC 19 (Lab)	24PBCS81	Big data analytics Lab	0	0	2	1	1
DSC 20 (Lab)	24PBCS82	Android Studio Lab	0	0	2	1	1

DISCIPLINARY SPECIFIC ELECTIVE COURSES

Category		Course	L	T	P	O	C
DSE 1	24DBCS11	Introduction to Cyber Security	3	0	0	2	3
	24DBCS12	Open Source Technology	3	0	0	2	3
DSE 2	24DBCS21	Data Structures and Algorithms	4	0	0	2	4
	24DBCS22	Computer Architecture and Organizations	4	0	0	2	4
DSE 3	24DBCS31	Multimedia and its applications	3	0	0	2	3
	24DBCS32	Data Visualization	3	0	0	2	3
DSE 4	24DBCS41	Software Engineering	4	0	0	2	4
	24DBCS42	Block Chain Technology	4	0	0	2	4
DSE 5	24DBCS51	Foundation of Artificial Intelligence	4	0	0	2	4
	24DBCS52	Natural Programming Language	4	0	0	2	4
DSE 6	24DBCS61	Introduction to Devops	4	0	0	2	4
	24DBCS62	Neural Networks	4	0	0	2	4
DSE 7	24DBCS71	Principles of Data Science	4	0	0	2	4
	24DBCS72	Fundamentals of Robotics	4	0	0	2	4
DSE 8	24DBCS81	Computational Intelligence	4	0	0	2	4
	24DBCS82	Parallel Processing	4	0	0	2	4

AECC & LANGUAGES

Category	Code	Course	L	T	P	O	C
LANG 1	24LTAM11/ 24LHIN11/ 24LFRE11	Tamil I / Hindi I/ French I	2	0	0	1	2
ENG 1	24LENG11	English I	2	0	0	1	2
LANG 2	24LTAM21/ 24LHIN21/ 24LFRE21	Tamil II / Hindi II / French II	2	0	0	1	2
ENG 2	24LENG21	English II	2	0	0	1	2
LANG 3	24LTAM31/ 24LHIN31/ 24LFRE31	Tamil III / Hindi III / French III	2	0	0	1	2
ENG 3	24LENG31	English III	2	0	0	1	2
AECC 1	24EVS031	Environmental Studies	3	0	0	2	3

MULTIDISCIPLINARY COURSES

Category	Code	Course	L	T	P	O	C
MDC 1	24BMA001	Mathematics- I	2	1	0	2	3
MDC 2	24BMA002	Mathematics – II	2	1	0	2	3
MDC 3	24BMA003	Statistics-I	2	1	0	2	3

MULTIDISCIPLINARY ELECTIVE

Category	Code	Course	L	T	P	O	C
MDE 1		Indian Knowledge System	2	0	0	1	2

VALUE ADDED COURSES

Category	Code	Course	L	T	P	O	C
VAC 1	24DVAC11	Universal Human Values	1	0	0	1	1
VAC 2	24DVAC21	Communication Skills	2	0	0	1	2
VAC 3	24DVAC41	Yoga Education / NSS / NCC	0	0	2	1	1
VAC 4	24DVAC51	Web Designing	2	0	0	1	2

SKILL ENHANCEMENT COURSES

Category	Code	Course	L	T	P	O	C
SEC 1	24SSKU11	Soft Skills I	2	0	0	1	2
SEC 2		Orientation Programme / Industrial Visit	-	-	-	-	-
SEC 3	24SSKU21	Soft Skills II	2	0	0	1	2
SEC 4	24SSKU31	Soft Skills III	2	0	0	1	2
SEC 5	24SBCS41	Industry Oriented Employability skills	1	0	2	1	2
SEC 6		In-plant Training/ Industrial Tour/ Summer Term	-	-	-	-	-
SEC 7		Entrepreneurial Development	2	0	0	1	2
SEC 8		Skill Enhancement Training / Student Club Activities/ Institution Innovation Council Activities	-	-	-	-	-
SEC 9	24SBCS61	Mini Project	0	0	4	1	2
SEC 10		On Job Training / Apprenticeship / Startup	-	-	-	-	-

SUMMER INTERNSHIP

Category	Code	Course	L	T	P	O	C
SI 1	24IBCS31	Internship I	0	0	2	1	1
SI 2	24IBCS51	Internship II	0	0	2	1	1

RESEARCH PROJECT

Category	Code	Course	L	T	P	O	C
RP 1	24RBCS71	Research Project I	0	0	12	4	6
RP 2	24RBCS81	Research Project II	0	0	12	4	6

SEMESTER I

24LTAM11 **தமிழ்மொழிப்பாடம்-1**

L	T	P	O	C
2	0	0	1	2

மொழிவரலாறு – சங்க இலக்கியம் – அற இலக்கியம் – மொழித்திறன்

பாடத்திட்ட நோக்கம்:

மாணவர்களின் இலக்கிய நாட்டத்தை மேம்படுத்துதல், தற்கால தமிழ் இலக்கிய வகைமைகளான மரபுக்கவிதை, புதுக்கவிதை, உரைநடை ஆகியவற்றை அறிமுகப்படுத்துதல், தமிழர்தம் வாழ்வியல் நெறிகளையும் பண்பாட்டுச் செழுமைகளையும் இன்றைய தலைமுறையினர் அறியச் செய்தல், மாணவர்களுக்குத் தமிழைத் தவறின்றி எழுதுவதற்குத் தேவையான பயிற்சி அளித்து அவர்களின் மொழித்திறனை மேம்படுத்துதல், செய்யுளின் நலத்தைப் பாராட்டும் முறைமையை அறியச் செய்து அதன்வழி சிந்தனை வளத்தைப் பெருகச் செய்தல் என்பனவும் மேற்கண்டவழி மாணவர்களை ஆளுமை மிக்கவர்களாக உருவாக்கி, போட்டித்தேர்வுகளுக்குத் தயார் செய்து அவர்களுக்கு வேலைவாய்ப்பை உருவாக்குவதும் இந்தப் பாடத்திட்டத்தின் முக்கிய நோக்கமாகும்.

அலகு- 1: தமிழ் மொழி வரலாறு **8 மணி நேரம்**

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.

அலகு -2 **8 மணி நேரம்**

புறநானூறு- பாடல் எண்: , 182, 183, - இரண்டு பாடல்கள்.

குறுந்தொகை- பாடல் எண்: 2, 167, - இரண்டு பாடல்கள்

பரிபாடல் - முருகன். வையை - இரண்டு பாடல்கள்

அலகு - 3 அற இலக்கியங்கள் **7 மணி நேரம்**

திருக்குறள்- வான்சிறப்பு (அறம்), பெருமை (பொருள்), பிரிவாற்றாமை (இன்பம்),. மூன்று அதிகாரங்கள் முழுமையும்

1. நாலடியார் - இரண்டு பாடல்கள். (2, 3)
2. மூதுரை - இரண்டு பாடல்கள். (2, 8)

அலகு 4 மொழி **7 மணி நேரம்**

பிழை நீக்கி எழுதுதல் - ஒற்றுப்பிழை நீக்கி எழுதுதல் - தொடர்பிழை நீக்கி எழுதுதல் - ஒற்று மிகும் இடங்கள் - ஒற்று மிகா இடங்கள் - பிற மொழிச் சொற்களை நீக்கி எழுதுதல் - பயிற்சிகள்.

மொத்தம்: 30 மணி நேரம்

பார்வை நூல்கள்

1. **தமிழர் நாகரிகமும் பண்பாடும்,** டாக்டர் அ. தட்சிணாமூர்த்தி (2001), ஐந்திணைப் பதிப்பகம்,
2. **தவறின்றித் தமிழ் எழுதுவோம்**, மா. நன்னன் (1999), ஏகம் பதிப்பகம்
3. **தவறின்றித் தமிழ் எழுத** - மருதூர் அரங்கராசன் (2003), ஐந்திணைப் பதிப்பகம்.
4. **தமிழ் இலக்கிய வரலாறு**, வரதராசன், மு.(2002), புது தில்லி : சாகித்திய அக்காதெமி.
5. **புதிய தமிழ் இலக்கிய வரலாறு**, நீல. பத்மநாபன், சிற்பி பாலசுப்ரமணியம் (2007), சாகித்திய அகாடெமி.
6. **செம்மொழி தமிழின் சிறப்பியல்புகள்** - முனைவர் மறைமலை இலக்குவனார்; https://www.youtube.com/watch?v=HHZnmJb4jSY
7. **பாடநூல் தேடலுக்கான இணையம் -** https://archive.org/

24LHIN11 **HINDI – I**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

- To enable the students to develop communication Skills
- To train students in official language
- To enrich their knowledge in Hindi Literature
- To teach them human values & create awareness towards importance of tourism
- To share the knowledge of their native place
- To teach them to use Azhagi, Azhagi+ fonts

UNIT I : 'Smruti' (Kahani) by Pandit Sriram Sharma. **6**

UNIT II : 'Athiti tum kab jaaoge' (Vyangy) by Harishankar Parsayi. **6**

UNIT III: 'Atatho Ghumakkad Jigyasa' (Yatra Vruthanth) by
Rahul Sanskrityayan. **6**

UNIT IV: Functional Hindi-Phrases use in Letter Writing.
Skill development - Bhav Ek Bhasha Anek **6**

UNIT V : Letter Writing- Intro. & Types & 3 Personal Letters **6**
Introduction to Azhagi, Azhagi + fonts

Total: 30 Hours

COURSE OUTCOMES:

At the end of this course Students will be able to

CO 1 Gain knowledge about the olden system of communication, olden living style existed in the villages, human values, giving due respect to other living beings, thriller style of storytelling .

CO 2 Understand to maintain their limits among their familiar circle and social responsibility

CO 3 Understand importance of exposure to various culture, human values and develop good character

CO 4 Know the Functional words in Hindi, various culture and languages of India

CO 5 Gain knowledge in drafting personal letters, equip themselves to Hindi typing thereby creating self-employment.

Text Books:

1. Pandit Sriram Sharma ka kahani: https://www.evidyarthi.in
2. Harishankar parasayi ka Vyangy: http://gadyakosh.org

Reference Book:

1. Rahul Sanskrityayan ka yatravruttant: https://www.hindwi.org

Web links :

1. Prayojanmoolak Hindi:https://hi.mwikipedia.org
2. https://www.azhagi.com/hnd/helphtml/Introduction.html

24LFRE11 **FRENCH – I**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

The lessons are being chosen:

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

UNITS:

1) Salut

les nombres, Les jours de la semaine et du mois, La nationalité **4**

2) Enchanté

Les verbes Etre, Avoir, Aller, Regular ER verbes, Present tense. **6**

3) J'Adore

La negation, l'adjectif possessif, le futur proche **4**

4) Tu veux bien

Les articles de finis/indéfinis, Les pronoms après une préposition (avec lui, chez moi), Le passé composé **7**

5) On se voit quand

Les pronoms compléments directs me, te, nous, vous, L'interrogation avec est-ce que, L'heure et la date. **5**

6) Bonne idée

Les articles partitifs, Le masculin et le féminin des adjectifs, Les pronoms compléments directs le, la, les, La négation : ne… pas de. 4

Total: 30 hours

COURSE OUTCOMES:

1) The students would be able to greet, to excuse and to introduce himself.
2) The students would be able to introduce someone.
3) The students would be able to express his ideas, opinions and weekend projects.
4) The students would be able to ask someone to do something, polite manner.
5) The students would be able to accept, refuse enquire and indicate the time and date.
6) The students would be able to express himself in positive and negative manner.

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

24LENG11 **ENGLISH – I**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

- To enable students to develop their communication skills effectively.
- To make students familiar with usage skills in the English Language.
- To enrich their vocabulary in English.
- To develop communicative competence.

UNIT I- PROSE 6

- Dangers of drug abuse - Hardin B. Jones
- Tight corners - E.V. Lucas

UNIT II -POETRY 6

- Ecology - A.K. Ramanujan
- The owl and the chimpanzee - Jo Camacho

UNIT III - SHORT STORY 6

- The Dear Departed - Stanley Houghton
- The Fool's Paradise- Isaac Bashevis Singer

UNIT IV -GRAMMAR 6

- Parts of speech, Articles

UNIT V -GRAMMAR 6

- One-word substitution, prefix, suffix, synonym, antonym.

Total: 30 Hours

COURSE OUTCOMES:

At the end of this course, the students would have learnt to

CO1	understand the characteristic features of the language used in the text.
CO2	strengthen their knowledge of basic grammar
CO3	improve narrative skills after studying diverse prose and play.
CO4	understand to classify parts of speech and articles.
CO5	develop critical writing skills in the textual content of the syllabus.

References:

1. Jeya Santhi (2015), English for Communication Enrichment
2. Dr. M. Narayana Rao and Dr. B. G.Barki,(2012)–Anu's Current English for Communication(AnuChitra).
3. Anu Chithra Pub (2010), Dr. Ananthan, R. Effective Communication. Ed. Chennai

24CBCS11 PROBLEM SOLVING APPROACHES USING C

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

The learner understands the basic concepts of programming languages. Also can learn reading and writing of data using arrays and pointers. This approaches a proper method for File Manipulations such as creating, processing, opening and closing.

UNIT I: INTRODUCTION 12

History of C - Importance of C - Basic structure of C - overview of C – C fundamentals: Character Set - C primitive input output - Identifier and Keywords – Tokens-Declaration. Data Types - Constants - Variables - Expressions – Statements- Library Functions.

UNIT II: OPERATORS AND CONTROL STATEMENT 12

Operators: Arithmetic, Unary, Relational and Logical, Assignment And Conditional Operators-Comma Operator - Bit Wise Operators - Flow Of Control If, If Else, While, Do-While, For Loop, Nested Control Structures - Switch, Break And Continue, Go To Statements.

UNIT III: FUNCTIONS AND STORAGE CLASSES 12

Functions –Definition – Types of functions - Passing Arguments – Recursions- Storage Classes - Automatic, External, Static, Register Variables.

UNIT IV: ARRAYS AND STRUCTURES 12

Arrays - Defining And Processing of Arrays-Types of Arrays - 2D Arrays-3D Arrays – Multi-Dimension Arrays- Passing Arrays To Functions - Structures – Defining and processing of Structure - Passing Structures To Functions - Self-Referential Structures – Unions.

UNIT V: POINTERS AND FILES 12

Pointers - Declarations - Passing Pointers to Functions - Operation in Pointers- Files: Creating, Processing, Opening and Closing a Data File- Case Studies.

Total: 60 hours

COURSE OUTCOMES:

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

CO-1: Evaluate real life applications developed by using C.

CO-2: Analyze the concepts of array, pointer, structure, union in C language.

CO-3: Apply control statements in various applications.

CO-4: Apply the knowledge of data types.

CO-5: Understand the concepts of tokens in C

Text Book:

1. E.Balaguruswamy (2017), Programming in ANSI C, TMH Publishing Company Ltd, 7th Edition

Reference Books:

1. Yashavant kanetkar (2016), Let us C solutions, 15th Edition, Kindle edition from BPB Publications.
2. H. Schildt (2017), The Complete Reference in C, TMH, 4th Edition.

Web Sources:

1. www.studytonight.com
2. www.javatpoint.com

24CBCS12 **DIGITAL LOGIC FUNDAMENTALS**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

To understand the concept of digital systems, to operate on various Number systems and simplify Boolean functions and to distinguish logical and combinational circuits.

UNIT I NUMBER SYSTEM AND CODES 9

Binary-why it is so important in computers? – Conversions: binary to decimal – decimal to binary – octal – Hexa decimal – ASCII code –Excess-3 Code – Gray Code –Gates: OR gates – AND gates – Boolean Algebra – NOR gates – NAND gates.

UNIT II BOOLEAN ALGEBRA 9

Boolean Law and theorems –sum of product method – K-Map truth tables – Pairs, Quads, Octets – K-Map simplifications – Don't care – product of sum method – product of sum simplifications.

UNIT III COMBINATIONAL LOGIC CIRCUIT 9

Multiplexers –Demultiplexers – Decoders – Encoders – Code Converters – Parity Generators & Checkers – PAL – PLA.

UNIT IV SEQUENTIAL LOGIC CIRCUITS I 9

Sequential Logic: RS, JK, D and T Flip-Flops – Edge-Triggered – Master – Slave Flip- Flops. Registers: Shift Registers – Types of Shift Registers

UNIT V SEQUENTIAL LOGIC CIRCUITS II 9

Types of ROMs - Types of RAMs -Counters: Asynchronous Counters- Ripple – Synchronous Counters – Shift Counters.

Total: 45 hours

COURSE OUTCOMES:

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

CO-1: Evaluate various types of K-Map simplification

CO-2: Analyze Boolean Algebra concepts

CO-3: Apply De-Morgan's law

CO-4: Understand the concepts of sequential logic circuits

CO-5: Understand the concepts of number system

Text Book:

1. D.P. Leach & A.P. Malvino (2002), Digital Principles and Application, THM Fifth Edition

Reference Books:

1. M.M. Mano (2001), Digital Logic and Computer Design, PHI
2. T.C. Bartee (1991), Digital Computer Fundamentals, 6th Edition, Tata McGraw Hill.
3. Donald D.Givone (2004), Digital Principles and Design – Tata McGraw – Hill Publishing Company Limited .

Web Sources:

1. www.tutorialspoint.com/computer_logical_organization
2. www.geeksforgeeks.org/digital-electronics-logic-design-tutorials

24BMA001 **MATHEMATICS-I**

L	T	P	O	C
2	1	0	2	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

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

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

UNIT-III: RELATIONS & FUNCTIONS 9

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

UNIT-IV: PARTIAL ORDER RELATIONS 9

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

UNIT-V: NUMBER SYSTEM AND CONVERSIONS 9

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

COURSE OUTCOMES:

CO1:	Apply the concept of Matrix and solving simultaneous equations	K3
CO2:	Understand the ideas of Sets and its applications.	K4
CO3:	Identify the relations for various functions .	K3
CO4:	Apply the concept of partial order relation for various sets.	K5
CO5:	Understand the conversion of various number system.	K3

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-orders-lattices/

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

24PBCS11 PROBLEM SOLVING APPROACHES USING C LAB

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

This course emphasizes the nature of C language using many applications and helps to understand the need to choose the language for solving the problem. The students can understand the art of computer programming.

LIST OF PROGRAMS:

1. a) Write a program to print first ten natural numbers.

   b) Write a program to find greatest of three numbers.

2. Write a program to find grade of a list of students given their marks.

3. Write a program to find gross salary of a person.

4. Write a program for counting the number of vowels, consonants, words, white spaces in a line of text and array of lines.

5. Write a program for palindrome.

6. Write a program for Fibonacci sequence.

7. Write a program to find GCD of two numbers.

8. Write a program to find NCR and NPR.

9. a)Write a program to find Towers of Hanoi.

   b) Write a program to find Maximum & Minimum.

10. Write a program for a) sin(x).

11. Write a program for Cos(x).

12. Write a program for Addition and Subtraction of Matrix.

Total: 30 Hours

COURSE OUTCOMES:

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

CO-1: Create Matrix addition and subtraction program using C.

CO-2: Evaluate String manipulation program using C.

CO-3: Apply recursive function to generate Fibonacci Sequence.

CO-4: Apply maths knowledge to find sinx and cosx .

CO-5: Apply control structure concept to find max min numbers.

Text Books:

1. E.Balaguruswamy (2017), Programming in ANSI C, TMH Publishing Company Ltd, 7th Edition,.
2. Yashavant kanetkar (2016), Let us C solutions, 15th Edition, Kindle edition from BPB Publications.
3. H. Schildt (2017), The Complete Reference in C, TMH, 4th Edition,.

Web links:

1. www.studytonight.com
2. www.javatpoint.com

24DVAC11 **UNIVERSAL HUMAN VALUES**

L	T	P	O	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

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

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 fulfillment. Harmony in existence and understanding co-existence at various levels.

UNIT-III IMPLICATIONS OF THE RIGHT UNDERSTANDING 5

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

COURSE OUTCOMES:

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

CO1: Develop qualities like responsibility and the ability to handle problems with sustainable solutions.

CO2: Appraise human values and the harmony at various levels.

CO3: Perceive a better critical ability.

CO4: Develop qualities pertaining to value-based living.

CO5: Apply what they have learnt to their own self in real life settings.

Text Books:

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

Reference Books:

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.

24SSKU11 **SOFT SKILLS -I**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

- To learn and apply basic etiquette for personal and professional interactions.
- To develop effective stress management techniques for maintaining mental and emotional well-being.
- To enhance self-awareness for personal growth and informed decision-making.
- To gain an overview of essential 21st-century skills necessary for success in a rapidly changing world.
- To foster creativity and critical thinking skills for innovative problem-solving and adaptability.

Unit I Introduction to Soft skills 6

- Soft Skills vs Hard Skills
- 15 important Soft Skills
- Communication Skills, Time Management, Leadership Skills

Unit II - Overview of 21st Century Skills. 6

- Lateral Thinking – Left Brain/Right Brain Functionality
- Problem solving skills

Unit III - Self Awareness 6

- Human Values
- Mindfulness
- SWOT Analysis
- PDCA Approach

Unit IV - Creativity/Critical Thinking 6

- Six Thinking Traits
- Creative writing exercises
- Open mindedness

Unit V - Personal Hygiene and Stress Management **6**

- Basic Etiquettes
- Health and Personal Grooming
- Stress-meaning and nature, Eustress, Distress
- Stress management strategies

Total: 30 Hours

COURSE OUTCOMES:

At the end of this course, the students would have learnt to

CO1	Demonstrate basic etiquette in various personal and professional settings.
CO2	Effectively manage stress using learned techniques.
CO3	Show increased self-awareness and make informed decisions.
CO4	Understand and articulate key 21st-century skills.
CO5	Apply creativity and critical thinking to solve problems innovatively.

References:

1. Alex, Dr. K. (2014), Soft Skills (1st edition) S Chand & Company
2. Taylor,(2005), Grant English Conversation Practice. Tata McGraw Hill Education Pvt. Ltd
3. Tiko, Champa& Jaya Sasikumar (1979), Writing with a purpose. OUP New Delhi
4. Nelson-Jones, R. (1992), Life skills, a handbook, Trowbridge, Wilts: Detesios Ltd.
5. Tuhovsky, Ian (2019), Communication Skills Training (2nd edition) Rupa Publication India.

SEMESTER II

24LTAM21 **TAMIL - II**

L	T	P	O	C
2	0	0	1	2

காப்பியம், பக்தி இலக்கியம், கலைகள், நாகரிகம்-பண்பாடு

பாடத்திட்ட நோக்கம்:

மாணவர்களின் இலக்கிய நாட்டத்தை மேம்படுத்துதல், அற இலக்கியங்கள், சிற்றிலக்கியம், சிறுகதை ஆகியவற்றை அறிமுகப்படுத்துதல், தற்காலப் பேச்சுத் தமிழ் எழுத்துத்தமிழ் ஆகியவற்றின் வளர்நிலைகளை மாணவர்களை அறியச் செய்தல், அதன்வழி சிந்தனை வளத்தைப் பெருகச் செய்தல் என்பனவும் மேற்கண்டவழி மாணவர்களை ஆளுமை மிக்கவர்களாக உருவாக்கி, போட்டித்தேர்வுகளுக்குத் தயார் செய்து அவர்களின் மொழித் திறனை மேம்படுத்த அவர்களுக்குக் கடிதம் எழுதும் கலையைக் கற்றுக்கொடுத்தல், அணி இலக்கணத்தை அறியச் செய்தல் என்பன இந்தப் பாடத்திட்டத்தின் முக்கிய நோக்கமாகும்.

அலகு 1 காப்பியங்கள் **8**

சிலப்பதிகாரம்- கனாத்திறம் உரைத்தக் காதை முழுவதும்.

மணிமேகலை- மலர்வனம் புக்க காதை முழுவதும்.

கம்பராமாயணம் - குகப் படலம் (தேர்ந்தெடுக்கப்பட்ட ஒன்பது பாடல்கள்)

அலகு 1: பக்தி இலக்கியம் **8**

1. மாணிக்கவாசகர் - திருவாசகம் - மூன்று பாடல்கள்
   - ✓ புல்லாகி பூடாகி (சிவபுராணம்)
   - ✓ எல்லாப் பிறப்பும் (சிவபுராணம்)
   - ✓ உற்றாரை யான் வேண்டேன் (திருப்புலம்பல்)
2. ஆண்டாள் - திருப்பாவை - மூன்று பாடல்கள் (1, 3, 4)
   - ✓ மார்கழித் திங்கள் ··· (பாசுரம் 1)
   - ✓ ஓங்கி உலகளந்த··· (பாசுரம் 3)

- ✓ ஆழிமழைக் கண்ணா… (பாசுரம் 4)

3. வீரமாமுனிவர் - தேம்பாவணி - வளன் சென்னித்தப் படலம்
4. சீறாப்புராணம்- மானுக்கு பிணை நின்ற படலம்

அலகு 3 கலைகள் **7**

சிற்பம் - ஓவியம் - இசை - கூத்து - ஒப்பனை - ஆடை அணிகலன்கள்.

அலகு 4 நாகரிகம், பண்பாடு **7**

சொற்பொருள் விளக்கம் - பண்டைத் தமிழர் வாழ்வியல் - அகம் - களவு - கற்பு - குடும்பம் - விருந்தோம்பல் - உறவு முறைகள் - சடங்குகள் - நம்பிக்கைகள் - பொழுதுபோக்கு - புறம் - போர் முறைகள் - நடுகல் வழிபாடு - கொடைப்பண்பு.

மொத்தம்: 30 மணி நேரம்

பார்வை நூல்கள்

1. **தமிழர் நாகரிகமும் பண்பாடும்,** டாக்டர் அ. தட்சிணாமூர்த்தி (2001), ஐந்திணைப் பதிப்பகம்,.
2. **தவறின்றித் தமிழ் எழுதுவோம்**, மா. நன்னன்(1999), ஏகம் பதிப்பகம்,.
3. **தவறின்றித் தமிழ் எழுத** - மருதூர் அரங்கராசன் (2003), ஐந்திணைப் பதிப்பகம்,
4. **தமிழ் இலக்கிய வரலாறு**, வரதராசன், மு.(2002), புது தில்லி : சாகித்திய அக்காதெமி,
5. **புதிய தமிழ் இலக்கிய வரலாறு**, நீல. பத்மநாபன், சிற்பி பாலசுப்ரமணியம் (2007), சாகித்திய அகாடெமி,
6. **செம்மொழி தமிழின் சிறப்பியல்புகள்** - முனைவர் மறைமலை இலக்குவனார்; https://www.youtube.com/watch?v=HHZnmJb4jSY
7. **பாடநூல் தேடலுக்கான இணையம் -** https://archive.org/

24LHIN21 **HINDI - II**

Prose, Official Letter Writing & Functional Hindi

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

- To train students in translation
- To develop reading & writing skills
- To create interest towards reading different types of literature
- To understand the value of Senior citizen
- To understand the importance of hard work
- To understand the patriotism and women empowerment
- To introduce the usage of Inscript keyboard

UNIT I : 'Boodee kaki" (Kahani) by Munshi Premchand **6**

UNIT II : 'Puraskar' (Kahani) by Prasad **6**

UNIT III: 'Main Narak Se Bhol Raha Hun' (Vyangy) by Harishankar Parsayi, **6**

UNIT IV: Functional Hindi- Technical & Designation & Department Names-50., Bhav Ek Bhasha Anek **6**

UNIT V : Functional Hindi-Letter Writing- 3 Official Letters. Inscript Keyboard knowledge **6**

Total: 30 Hours

COURSE OUTCOMES:

At the end of this course Students will be able to

CO1 Know to the value senior citizen, their love and affection towards the family members

CO2 Know the importance of patriotism and women empowerment in the society

CO3 Know the value of hard work in human life

CO4 Gain fair knowledge of Functional Hindi and fluency in speaking Hindi

CO5 Equip themselves in writing official letters in Hindi importance of translation of technical words and equip knowledge in using in script keyboard thereby improving their employability

Text Books:

1. Munshi Premchand (2007), Manasarovar, http://gadyakosh.org
2. Jaishankar Prasad/ http://gadyakosh.org

Reference books:

1. Harishankar Parsai/ https://hindikahani.hindi-kavita.com
2. Prayojanmoolak Hindi:https://hi.mwikipedia.org

Weblink:

1. https://rajbhasha.gov.in/en/introduction

24LFRE21 **FRENCH - II**

L	T	P	O	C
2	0	0	1	2

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 futur

Unit I

1) **C'est où**

L'impératif, Les articles contractés au, à la…, Le passé composé et l'accord du participe passé avec être.

5

2) **N'oubliez pas**

Le pronom relatif Qui, que, où, Les pronoms compléments indirects (me, te, lui, leur…)

5

3) **Belle vue sur la mer --**

Les adjectifs démonstratifs, Y- pronom complément.

4

4) **Quel beau voyage!**

Les verbes pronominaux, En- pronom complément.

4

5) **Oh ! joli**

L'imparfait, L'imparfait ou le passé composé.

5

6) **Et après ?**

Le futur simple, Le subjonctif présent.

7

Total: 30 Hours

COURSE OUTCOMES:

1) The students would be able to express his/her where about and to ask direction
2) The students would be able to express obligation and restriction
3) The students would be able to describe a place
4) The students would be able to narrate and to question
5) The students would be able to describe someone
6) The students would be able to express his desire and to speak about the future

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

24LENG21 **ENGLISH - II**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

- To read and understand different types of prose, poetry, and fiction.
- To think critically about texts and express ideas clearly.
- To recognize and discuss key themes and styles in literary works.
- To learn and use grammar rules correctly in writing and speaking.
- To write more effectively by applying grammar and literary techniques.

Unit I -Prose **6**

- If you are wrong, admit it- Dale Garnegie
- Words of Wisdom- Chetan Bhaghat

Unit II – Poetry **6**

- La Belle Dame Sans Merci - John Keats
- Ozymandias- P.B.Shelley

Unit III – Fiction **6**

- The School for Empathy - E.V. Lucas
- The Lamb to the Slaughter-Roald Dahl

Unit IV – Grammar **6**

- Types of sentences, Concord

Unit V – Grammar **6**

- Tenses, Voices

Total: 45 Hours

COURSE OUTCOMES:

At the end of this course, the students would have learnt to

CO1	identify poetic expressions in the course of daily speech
CO2	students will develop skills that enable them to communicate effectively in writing.
CO3	students will develop skills that enable them to communicate effectively in writing.
CO4	discriminate against different sensibilities in approaching life.
CO5	strengthen the ability to solve life's problems, as highlighted in the selections.

References:

1) June., Dr. M. Narayana Rao and Dr. B. G. Barki (2012), Anu's Current English for Communication(AnuChitra).
2) General English for competitive examinations by V.Rajagopalan (2010), Mcgraw Hill Education.

24CBCS21 OBJECT ORIENTED PROGRAMMING LANGUAGES

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

The course provides insight knowledge about object-oriented programming conceptsand programming language in C++ and JAVA.

UNIT I OBJECT ORIENTED PROGRAMMING AND BASICS OF C++ 9

Principles of Object-Oriented Programming – Beginning with C++ - Applications of C++ - Tokens –Keywords- Expressions – Data Types – Storage Classes – Operators –Manipulators- Typecast Operator – Arrays –Strings-Control Structures – Operator Overloading -Functions in C++ - Function Prototyping – Call by Reference – Inline Functions –Recursion – Function Overloading – Friend and Virtual Function.

UNIT II CLASSES AND OBJECTS AND OPERATOR OVERLOADING 9

Introduction – Classes and Objects – Constructors –Parameterized Constructors – Copy Constructor – Dynamic Constructors – Destructors – Introduction to Operator Overloading – Overloading Unary Operator – Overloading Binary Operator – Type Conversions.

UNIT III INHERITANCE AND POLYMORPHISM 9

Introduction- Defining Derived Classes - Inheritance – Types of Inheritance – Abstract Classes - Introduction to Virtual Functions - Pure Virtual Function-Polymorphism – Exception Handling.

UNIT IV JAVA INTRODUCTION, ARRAYS AND STRINGS 9

Java Evolution - Overview of Java Language – Constants – Variables – Data Types – Operators and Expressions – Class, Objects and Methods – Arrays, Strings and Vectors.

UNIT V PACKAGES AND MULTITHREADING 9

Introduction – Java API Packages – Creating Packages – Accessing a Package – Adding a Class to a package – Multithreading – Creating Threads - Life Cycle of a Thread – Thread Exceptions – Inter-Thread Communication.

Total: 45 Hours

COURSE OUTCOMES:

At the end of this course students will be able to,

CO1: Develop an in-depth understanding of functional, logic, and object-oriented Programming Paradigms.

CO2: An understanding of the concepts of inheritance and polymorphis and ability to overload Operators in C++.

CO3: An understanding of the difference between function overloading and function overriding.

CO4: An ability to write object-oriented programs of moderate complexity in Java. An understanding the concepts of class, objects and methods in java and strings.

CO5: An ability to create packages, accessing a package and adding a class to package and threads.

Text Books:

1. Paul Deitel and Harvey Deitel (2015), "C++ How to Program", Nineth Edition, Prentice Hall
2. Herbert Schildt (2011), "Java The complete reference", Eighth Edition, McGraw Hill Professional

Reference Books:

1. Balagurusamy E. (2012), "Object oriented programming using C++ and JAVA", First Edition,Tata,McGraw–Hill Education.

Web links:

1.https://www.geeksforgeeks.org/introduction-of-object-oriented-programming/

2.https://www.educative.io/blog/object-oriented-programming

24CBCS22 **DATABASE MANAGEMENT SYSTEM**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

This course introduces the basic concepts of Database Management System, the Structured Query Language (SQL) and PLSQL. The students gain knowledge about Database, Data models, Relational Algebra, Normalization, SQL, PL/SQL and Stored Procedure.

UNIT – I INTRODUCTION 9

DBMS Definition, Characteristics of DBMS ,Application and advantages of DBMS, Instances , Schemas and Database States, Three Levels of Architecture , Data Independence, DBMS languages, Data Dictionary, Database Users, Data Administrators.

UNIT – II DATA MODELS 9

Data Models, types and their comparison, Entity Relationship Model, Entity Types, Entity Sets, Attributes and its types, Keys, E-R Diagram, Data Integrity, RDBMS –Concept, Components and Codd's rules.

UNIT – III RELATIONAL ALGEBRA AND NORMALIZATION 9

Relational Algebra (selection, projection, union, intersection, Cartesian product, Different types of join like theta join, equi-join, natural join, outer join) Functional Dependencies, Good & Bad Decomposition, Anomalies as a database: A consequences of bad design, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF.

UNIT – IV INTRODUCTION TO SQL 9

Introduction to SQL: DDL, DML, and DCL statements, Creating Tables, Adding Constraints, Altering Tables, Update, Insert, Delete & various Form of SELECT- Simple, Using Special Operators for Data Access. Aggregate functions, Joining Multiple Tables (Equi Joins), Joining a Table to itself (self Joins) Functions.

UNIT – V PL/SQL 9

Introduction to PL/SQL (blocks of PL/SQL, Variables, constants), Control Structure Introduction to Stored Procedures, Functions, Cursor and Triggers-Case Study.

Total: 45 Hours

COURSE OUTCOMES:

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

CO - 1: Analyze different types of SQL statements.

CO - 2: Apply the query knowledge to write PL/SQL code.

CO - 3: Apply ideas to combine tables using join.

CO - 4: Apply knowledge to write simple query.

CO – 5: Understand the fundamental concepts of DBMS.

Text Books:

1. A. Silberschatz, H. F. Korth, S.Sudharsan (2011), Database System Concepts,Sixth Edition, Tata McGraw Hill
2. Ivan Bayross (2015), SQL,PL/SQL, The programming language of Oracle, Second Revised Edition, BPB Publication

Reference Books:

1. R.Elmasri, S.B.Navathe (2008), Fundamentals of Database systems, Fifth Edition,Pearson Education
2. C. J. Date (2005), Introduction to Database Systems, Fifth Edition, Pearson Education,

Web links:

1. www.guru99.com/dbms-tutorial.html
2. www.oracletutorial.com

24BMA002 **MATHEMATICS- II**

L	T	P	O	C
2	1	0	2	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 1: FUNDAMENTALS OF LOGIC 9

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

UNIT 2: LOGIC AND TATUOLOGY 9

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

UNIT 3: PERMUTATIONS AND COMBINATIONS 9

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

UNIT 4: BASICS OF PROBABILITY 9

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

UNIT 5: RANDOM VARIABLES 9

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

Total : 45 Hours

COURSE OUTCOMES:

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

CO1:	Apply the basic concepts of Mathematical reasoning.	**K3**
CO2:	Understand the types of logic	**K4**
CO3:	concept based on permutation and combinations.	**K3**
CO4:	Apply the concepts of Probability.	**K5**
CO5:	Understand the concepts of Random Variables.	**K3**

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/

24PBCS21 OBJECT ORIENTED PROGRAMMING LANGUAGES LAB

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

The purpose of this course is to introduce to students to the field of programming using C++ and Java. Be able to use the Java SDK environment to create, debug and run simple Java programs.

LIST OF PROGRAMS:

1. Design C++ classes with static members, methods with default arguments.
2. Implement complex number class with necessary operator overloading using C++.
3. C++ program to illustrate concept of Virtual Functions
4. Implement Multiple Inheritance using C++
5. Program to Demonstrate Operator Overloading using C++
6. Programs illustrating various data types in java.
7. Programs to implement method overloading in java.
8. Programs illustrating the implementation of various forms of inheritance (single, hierarchical, multilevel).
9. Programs to implement polymorphism and method overriding in java.
10. Programs implementing exception handling.
11. Programs to illusate interfaces in java.
12. Programs to create package in java

Total: 15 Hours

COURSE OUTCOMES:

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

CO-1: Create an application to solve the real time problems using OOP techniques.

CO-2: Develop a using Inheritance and Multithreaded applications

CO-3: Implement the use of Abstract classes an Interfaces.

CO-4: Implement the concepts of Exception handling.

CO-5: Create an application for polymorphism and Virtual Functions.

Text Books:

1. Paul Deitel and Harvey Deitel (2015), "C++ How to Program", Nineth Edition, Prentice Hall
2. Herbert Schildt (2011), "Java The complete reference", Eighth Edition, McGraw Hill Professional

Reference Books:

1. Balagurusamy E. (2012), "Object oriented programming using C++ and JAVA", First Edition,Tata,McGraw–Hill Education.

Web Sources:

1.https://www.geeksforgeeks.org/introduction-of-object-oriented-programming/

2.https://www.educative.io/blog/object-oriented-programming

24PBCS22 **RDBMS LAB**

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

- To give a good formal foundation on the relational model of data.
- To present SQL and procedural interfaces to SQL comprehensively.
- To present the concepts and techniques relating to query processing by SQL engines.
- To present the concepts and techniques relating to ODBC and its implementations.

LIST OF PROGRAMS:

1. Write a Program to create table and insert values using DDL Commands.
2. Write a Program to implement DML commands.
3. Write a Program on Types of Data Constraints.
4. Write a Program on Joins.
5. Write a Program on group-by clause and order-by clause.
6. Write a Program on different functions (aggregate, math and string).
7. Write a Program on different types of sub queries.
8. Write a Program on different SET Operations.
9. Write a Program on implementing Factorial, Fibonacci Series using PL/SQL.
10. Write a Program to implement triggers and cursors.
11. Write a program that creates the function and calculating area of circle.
12. Write a program that uses the concept of user defined exception

Total: 15 Hours

COURSE OUTCOMES:

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

CO-1: Create an application to check user defined exception using PL/SQL.

CO-2: Evaluate the functionalities of trigger and cursor.

CO-3: Analyze different types of built-in function in PL/SQL.

CO-4: Apply DDL, DML and DCL statement using SQL.

CO-5: Apply various types of joins in tables.

Text books:

1. A. Silberschatz, H. F. Korth, S.Sudharsan (2011), Database System Concepts,Sixth Edition, Tata McGraw Hill.
2. Ivan Bayross (2015), SQL,PL/SQL, The programming language of Oracle, Second Revised Edition, BPB Publication

Reference Books:

1. R.Elmasri, S.B.Navathe (2008), Fundamentals of Database systems, Fifth Edition,Pearson Education
2. C. J. Date (2005), Introduction to Database Systems, Fifth Edition, Pearson Education.

Web Sources:

1. www.guru99.com/dbms-tutorial.html
2. www.oracletutorial.com

24DVAC21 **COMMUNICATION SKILLS**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

- To develop effective verbal and non-verbal communication techniques for variouscontexts.
- To enhance listening skills for better comprehension and engagement in conversations.
- To improve written communication abilities, focusing on clarity, coherence, and style.
- To build confidence in public speaking through practice and constructive feedback.
- To cultivate interpersonal skills for successful collaboration and professional interactions.

Unit I –Introduction to Communication Skills **6**

- Fundamentals of Communications
- Elements of Communication, Types of Communication

Unit II - Practical English **6**

- Importance of the language - Word Usage and Jargon
- Tenses and the effectiveness - Basics of grammar (Noun/Verb/Adverb/Conjunction)

Unit III - Effective Communication **6**

- LSRW (Listening, Speaking, Reading & Writing)
- Pronunciation - Vocabulary Building
- Intonations & its importance

Unit IV - Workplace Communication **6**

- Basics of telephone etiquette
- E-Mail writing
- Presentation Skills
- Interpersonal Skills
- Business English

Unit V - Quantitative Ability **6**

- Verbal Ability - Verbal Analogy
- Debating Skills - Public Speaking

Total : 30 Hours

COURSE OUTCOMES:

At the end of this course, the students would have learnt to

CO1	Enhance participants' business communication skills
CO2	Enhance LSRW Skills (LSRW – Listening, Speaking, Reading & Writing)
CO3	Express opinions at free will in social/ personal gathering
CO4	Impact leadership qualities among participants
CO5	Engage in conversation with others to exchange ideas

Text Books:

1. Andreja. J. Ruther Ford (2011),Basic communication skills for Technology, 2nd Edition, Pearson Education.
2. Barun K Mitra (2011), Personality development and soft skills, 1 st Edition, Oxford Press.
3. Elizabeth Harren, 7 April (2022), last updated: 16 November, (2023)
4. Kerry Patterson, Joseph Grenny, Ron McMillan, Al Switzler (McGraw-Hill)

Reference Books:

1. Ethan Beute and Stephen Pacinelli (Greenleaf)
2. Francis Peters SJ (2011), Soft skills and professional communication, 1stEdition, McGraw Hill Education.

24SSKU21 **SOFT SKILLS-II**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

- To develop strategies to enhance teamwork and collaboration in professional settings.
- To cultivate a positive attitude and mindset to foster constructive relationships and productivity.
- To develop leadership, decision-making and team bonding skills

Unit I - Professional Behaviour 6

- Team Building – Team Bonding
- Inter-Personal Relationship– Intra-Personal Relationship

Unit II - Personality Development 6

- Types of Personality
- Self-Confidence - Confidence Building
- Attitude (Positive/Negative)

Unit III - Telephone Etiquette 6

- Basics of telephone etiquette
- Giving clear and concise information
- Tone & rate of speech
- Intonations & its Importance
- Whatsapp Communications

Unit IV - Decision Making 6

- Types of Decisions – planned-unplanned, individual-group, major-minor
- Types of Leadership styles – Autocratic, democratic, lesse-faire, participative, bureaucratic.

Unit V- Professional Etiquette 6

- Respect – Salutations
- Official Behaviour

Total :30 Hours

COURSE OUTCOMES:

At the end of this course, the students would have learnt to

CO1	Understand the principles of effective team building and apply strategies to foster team bonding and cohesion in professional settings.
CO2	Become self-confident individuals by mastering interpersonal skills, team management skills, and leadership skills.
CO3	Practice techniques for effective communication in telephone conversations.
CO4	Evaluate decision-making processes and their implications in professional settings.
CO5	Exhibit professional conduct and demeanor in various professional situations.

Reference Books:

1. Language Service, Universitat Oberta de Catalunya
2. Taylor (2005), Grant English Conversation Practice. Tata McGraw Hill Education Pvt. Ltd.
3. Tiko, Champa& Jaya Sasikumar(1979), Writing with a purpose. OUP New Delhi
4. Alex, Dr. K. (2014), Soft Skills (1st edition) S Chand & Company.
5. Nelson-Jones, R. (1992), Life skills, a handbook, Trowbridge, Wilts: Detesios Ltd.

DISCIPLINARY ELECTIVE COURSES

24DBCS11 **INTRODUCTION TO CYBER SECURITY**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

This course provides the foundation for understanding the key issues associated with protecting information assets. The purpose of the course is to provide the student with an overview of the field of information security and assurance.

UNIT I INTRODUCTION 9

Introduction to Cyber Security - Importance and challenges in Cyber Security - Cyberspace - Cyber threats - Cyber warfare - CIA Triad - Cyber Terrorism - Cyber Security of Critical Infrastructure - Cyber security -Organizational Implications.

UNIT II HACKERS AND CYBER CRIMES 9

Types of Hackers - Hackers and Crackers - Cyber-Attacks and Vulnerabilities - Malware threats - Sniffing - Gaining Access - Escalating Privileges - Executing Applications - Hiding Files - Covering Tracks - Worms - Trojans - Viruses - Backdoors

UNIT III ETHICAL HACKING AND SOCIAL ENGINEERING 9

Ethical Hacking Concepts and Scopes - Threats and Attack Vectors - Information Assurance - Threat Modeling - Enterprise Information Security Architecture - Vulnerability Assessment and Penetration Testing - Types of Social Engineering - Insider Attack - Preventing Insider Threats - Social Engineering Targets and Defense Strategies.

UNIT IV CYBER FORENSICS AND AUDITING 9

Introduction to Cyber Forensics - Computer Equipment and associated storage media - Role of forensics Investigator - Forensics Investigation Process - Collecting Network based Evidence - Writing Computer Forensics Reports - Auditing - Plan an audit against a set of audit criteria - Information Security Management System Management. Introduction to ISO 27001:2013.

UNIT V CYBER ETHICS AND LAWS 9

Introduction to Cyber Laws - E-Commerce and E-Governance - Certifying Authority and

Controller - Offences under IT Act- Computer Offences and its penalty under IT Act 2000 - Intellectual Property Rights in Cyberspace.

Total: 45 Hours

COURSE OUTCOMES:

At the end of this course students will be able to,

CO-1: Understand the broad set of technical, social & political aspects of Cyber Security.

CO-2: Explore about Various types of Hackers and Threats and ways of sniffing.

CO-3: Understand the importance of ethical hacking tool and Process.

CO-4: Implementing ethical hacking tools in an organization.

CO-5: Apply methods for authentication, access control, intrusion detection andprevention and conduct research in Cyber Security.

Text Books:

1. Donaldson, S., Siegel, S., Williams, C.K., Aslam, A (2015), "Enterprise Cyber security - How to Build a Successful Cyber defense Program against Advanced Threats", Apress, 1st Edition.
2. Nina Godbole, Sumit Belapure (2011), "Cyber Security", Willey,

Reference Books:

1. Roger Grimes (2017), "Hacking the Hacker", Wiley, Ist Edition
2. Cyber Law by Bare Act (2000), Govt of India, It Act

Web links

https://www.javatpoint.com/what-is-cyber-security

24DBCS12 **OPEN SOURCE TECHNOLOGY**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

To demonstrate different open source technology like Linux, PHP & MySQL with different packages. To lustrate Linux commands for programming. To explore programs of PHP with MySQL connection.

UNIT I INTRODUCTION TO OPEN SOURCE 9

Open Source Definition, The distribution terms of open source software, open source technology importance Free and open Source Software (FOSS), LAMP (Linux, Apache, MySQL, PHP, Python, and Perl) Benefits, Perspective of Open Source software Linux and Open Source, basic commands of Linux. Introduction to PHP – what does PHP Do? – a brief history of PHP – language basics – lexical structure – data types – variables – expressions and operators – flow control statements – including code – embedding PHP in web pages.

UNIT II FUNCTIONS & STRINGS 9

Functions & Strings: Calling a function – defining a function – variable scope – function parameters – return values – variable functions anonymous function. Strings: Accessing individual characters – cleaning strings – encoding and escaping – comparing strings – manipulating and searching strings – regular expression.

UNIT III ARRAYS & OBJECTS 9

Arrays and Objects : Indexed Vs associative arrays – identifying elements of an array – storing data in arrays – multidimensional arrays – extracting multiple values – converting between arrays and variables – traversing arrays – sorting. Objects: Creating an object – accessing properties and methods – declaring a class – introspection.

UNIT IV MYSQL AN OVERVIEW 9

Introduction – Entering queries – Creating and using a database – Creating and selecting a database – creating a table – loading data into a table – Retrieving information from a table – selecting all data – selecting particular rows – selecting particular columns – sorting rows – date calculations – working with NULL values – pattern matching – counting rows – using more than one tables.

UNIT V WORKING WITH MYSQL ADMIN 9

Working with PHP Myadmin - Getting Information about Databases and Tables -Examples of Common Queries - Create student information and Emplyee database.

TOTAL: 45 hours

COURSE OUTCOMES:

CO-1: To explore different open source technology like Linux, PHP & MySQL with different packages.

CO-2: To understand the String functions.

CO-3: To understand the concepts of Arrays.

CO-4: To understand the concepts of connecting and MySQL.

CO-5: To be well versed in creating an application using PHP and MySQL.

Text Books:

1. Red Hat Linux Bible by Christopher Negus (2010). Wiley Publishing ISBN: 0-7645-4333-4,
2. Sams,Teach yourself PHP, MySQL and Apache all in one by Julie C Meloni. SAMS Publication, Fifth Edition
3. Rasmus Lerdorf, Kevin Tatroe, Bob Kaehms, Ric McGredy (2002), Programming PHP, O'REILLY (SPD), First edition.

Reference Books

1. Lee Babin, Nathan A. Good, Fran4k M. Kromann, Jon Stephens (2005), "PHP 5 Recipes, A problem solution approach", après Special edition.
2. PHP & MYSQL in easy steps by MCGrawHill Indian edition, First Edition
3. The Complete Reference PHP by Steven Holzner MCGrawHill, Indian edition, First Edition

Web links

1. https://www.tutorialspoint.com//cakephp/cakephp_form_handling.htm
2. http://www.php.net/tut.php

24DBCS21 COMPUTER ARCHITECTURE AND ORGANIZATIONS

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

This course introduces the basic concept of computer architecture, addressing modes, floating-point arithmetic operations, pipelining, hazards, parallelism, hierarchical memory system, direct memory access, I/O processors

UNIT I OVERVIEW & INSTRUCTIONS 12

Eight ideas – Components of a computer system – Technology – Performance – Power wall – Uniprocessors to multiprocessors; Instructions – operations and operands – representing instructions – Logical operations – control operations – Addressing and addressing modes.

UNIT II ARITHMETIC OPERATIONS 12

ALU - Addition and subtraction – Multiplication – Division – Floating Point operations – Subword parallelism.

UNIT III PROCESSOR AND CONTROL UNIT 12

Basic MIPS implementation – Building datapath – Control Implementation scheme – Pipelining – Pipelined datapath and control – Handling Data hazards & Control hazards – Exceptions.

UNIT IV PARALLELISM 12

Instruction-level-parallelism – Parallel processing challenges – Flynn's classification – Hardware multithreading – Multicore processors

UNIT V MEMORY AND I/O SYSTEMS 12

Memory hierarchy - Memory technologies – Cache basics – Measuring and improving cache performance - Virtual memory, TLBs - Input/output system, programmed I/O, DMA and interrupts, I/O processors.

TOTAL: 60 Hours

COURSE OUTCOMES:

CO-1: To make students understand the basic structure and operation of digital computer.

CO-2: To familiarize the students with arithmetic and logic unit and implementation of fixed point and floating-point arithmetic operations.

CO-3: To understand the concepts of hazards and exceptions.

CO-4: To impart knowledge about concept of parallelism.

CO-5: To familiarize the students with hierarchical memory system including cache memories and virtual memory.

Text Books:

1. David A. Patterson and John L. Hennessey (2014), "Computer organization and design", Morgan Kauffman / Elsevier, Fifth edition,.
2. V.Carl Hamacher, Zvonko G. Varanesic and Safat G. Zaky (2012), "Computer Organisation", VI th edition, Mc Graw-Hill Inc,.
3. William Stallings (2006),"Computer Organization and Architecture", Seventh Edition, Pearson Education,

Reference Books:

1. Vincent P. Heuring, Harry F. Jordan (2005), "Computer System Architecture", Second Edition, Pearson Education,.
2. Govindarajalu, (2005), "Computer Architecture and Organization, Design Principles and Applications", first edition, Tata McGraw Hill, New Delhi,
3. John P. Hayes (1998), "Computer Architecture and Organization", Third Edition, Tata Mc Graw Hill,.

Web links

1. http://nptel.ac.in/.

24DBCS22 DATA STRUCTURES AND ALGORITHMS

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

To familiarize the students with linear and nonlinear data structures, to understand sorting and searching, to manipulate the complexity of data structures using asymptotic notations and to apply the data structures in solving problems.

UNIT I INTRODUCTION TO DATA STRUCTURES 12

Introduction to Data Structures- Why Data Structures – Operations of Data Structures – Data Types – Arrays and Lists – Representation Of Arrays – Operations On Arrays - Abstract Data Types (ADTs) – List ADT.

UNIT II LINEAR DATA STRUCTURE 12

Stack: Operations of Stack – Representation – Implementation – Infix to Postfix Conversion – Postfix Evaluation – Recursion – Maze Problem – Queue: Operations of Queue – Representation – Implementation – Job Processing using Queue – Circular Queue – Double Ended Queue – Linked List: Representation – Implementation – Polynomial Addition – Doubly Linked List – Circular List – Circular Doubly Linked List.

UNIT III NON LINEAR DATA STRUCTURES 12

Non Linear Data Structures – Trees: Terminologies in Trees – Representation – Types of Trees – Forest – Transforming Forest into Binary Trees - Traversal Techniques – Applications of Trees – Graphs: Terminologies in Graphs – Representation – Depth First Search – Breadth First Search – Applications of Graphs – Shorest Path- Travelling Salesman Problem – Dijkstra's Algorithm – Types of Graphs.

UNIT IV SORTING AND SEARCHING 12

Sorting: Bubble Sort – Selection Sort – Merge Sort – Insertion Sort – Quick Sort – Heap Sort – Searching: Linear Search – Binary Search – Divide and Conquer – Hashing - Hash Table – Direct Address Method – Mapping Function – Handling Collision.

UNIT V COMPLEXITY AND CASE STUDIES 12

Asymptotic Notation – Big Oh Notation – Omega Notation – Tita Notation – Complexity: Space

Complexity – Time Complexity – Space and Time Complexities of Data Structures – Case Studies: Searching for Patterns- Inventing a new sorting Algorithm - Synthesizing Concurrent Graph Data Structures.

Total: 60 Hours

COURSE OUTCOMES:

At the End of this course, the students will be able to:

CO 1: Analyze unstructured problems and design computer solutions.

CO 2: Apply or create suitable algorithm to solve a particular problem.

CO 3: Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.

CO 4: Apply use recursion to solve a problem with a binary search tree or graph.

CO 5: Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.

Text Books:

1. E.Horowitz and S.Shani (2009), Fundamentals of Data Structures in C++, Galgotia Pub.
2. Horowitz, S. Sahni, and S. Rajasekaranm (2012), Computer Algorithms, Galgotia Pub. Pvt. Ltd.,

Reference Books:

1. R. Kruse C.L. Tondo and B. Leung (1997), Data Structures and Program design in C, PFU
2. Gav Pai (2017), "Data structures and algorithms, concepts, techniques and Applications", McGraw Hill

Web links:

1. www.nptel.com
2. www.hackerearth.com/practice/data-structures/arrays/1-d/tutorial/