

INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)
(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)
PALLAVARAM, THALAMBUR, PERIYAPALAYAM-CHENNAI
ACCREDITED BY NAAC WITH 'A++' GRADE

UNDER GRADUATE DEGREE PROGRAMME

B.Sc Information Technology
Three Years

/

B.Sc., (Hons) Information Technology

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 Information Technology
School of Computing Sciences

VELS

INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)
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DEPARTMENT OF INFORMATION TECHNOLOGY

VISION OF THE DEPARTMENT
To produce globally competent graduates, skilled intellectual professionals and a successful entrepreneur in the field of Computer Science and Information Technology to meet the current challenges in the fast-growing IT industry.

MISSION OF THE DEPARTMENT	
M1	To provide strong theoretical and practical knowledge to the students in the computer science discipline
M2	To equip our students to attain the skill set Imperative to harness the opportunities present in this dynamic Environment
M3	To provide technical & skill-based quality training to students in the field of Information technology
M4	To empower the Youth in rural communities with computer knowledge
M5	To inculcate knowledge about socio-economic duties & responsibilities, human & ethical values to become an optimistic global citizen and a life-long learner.
M6	To provide environmental education to empower knowledge on ecological issues and to protect and conserve invaluable natural resources for healthy and sustainable livelihoods.

PROGRAMME EDUCATIONAL OUTCOMES (PEO)	
PEO1	Exhibit practical hands-on experience on the core and fundamentals of Information Technology
PEO2	Display practical knowledge, identify and find solutions to problems related to the latest trends in the field of Information technology
PEO3	Collaborate Work as a team in inter-disciplinary and intra-disciplinary projects to develop hardware and software solutions for diverse applications based on digital
PEO4	Develop analytical, critical, and innovative thinking skills, leadership qualities, and a good attitude well prepared for lifelong learning and services in various IT fields
PEO5	Publish research findings and innovations to find solutions for prevailing social Issues

PROGRAMME OUTCOMES (PO)	
PO1	**Expertise in Domain:** Provide students with fundamental knowledge and ability to expertise Computer Science and information technology
PO2	**Insight to problem solving:** Provide insight to problem solving to succeed in Technical Profession
PO3	**Critical Thinking:** Apply knowledge of Computer Science to identify, analyze, problems and to provide effective solutions in the area of Computing
PO4	**Computing Skills and Ethics:** Analyze a problem, identify and define the computing requirements appropriate to its solution
PO5	**Analytical skill:** Ability to design, develop algorithms, and provide software solutions to cater the industrial needs
PO6	**Modern Tool Usage:** Use current techniques, skills, and tools necessary for computing practices
PO7	**Employability Skills:** Inculcate skills to excel in the fields of Information Technology and its Enabled services, Government and Private sectors, Teaching and Research

PO8	**Ethics:** Insists ethical responsibilities, human and professional values and makes their contribution to society
PO9	**Self-Directed and Life-long Learning:** Engaged in lifelong learning to equip them to the changing environment and be prepared to take up mastering programs
PO10	**Societal Responsibility:** Interpret and apply the implications of environment awareness initiatives incorporated in curriculum

	PROGRAMME SPECIFIC OUTCOMES (PSO)
PSO1	Understand the basic concepts of programming, multimedia, animation, web designing, networking and to acquire various domain knowledge
PSO2	Build computer programs in different programming languages to solve problems effectively
PSO3	Develop knowledge to build computer programs in solving problems effectively
PSO4	Evaluate appropriate techniques to tackle and solve problems in the discipline of information security management
PSO5	Examine effectively in both verbal and written form in industry and society
PSO6	Work in teams to build software systems and apply the technologies in various fields of Information Technology

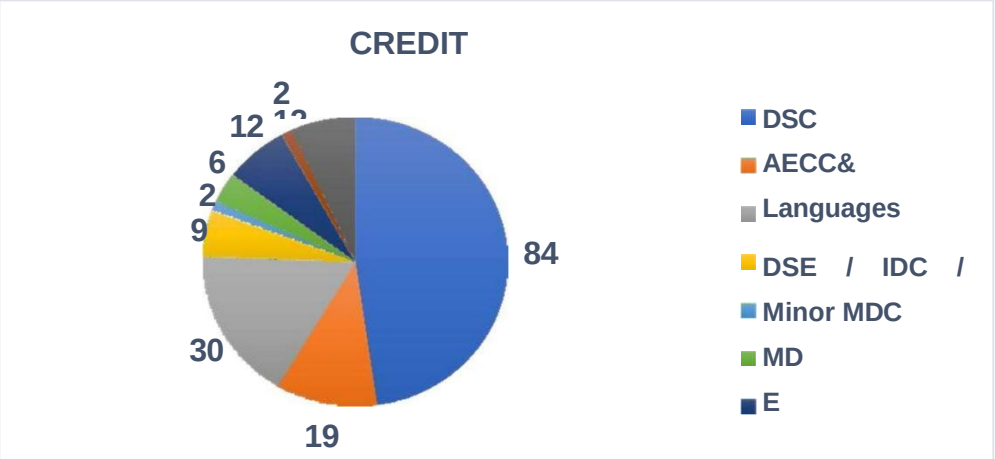
BOARD OF STUDIES
List of Members
Department of Information Technology

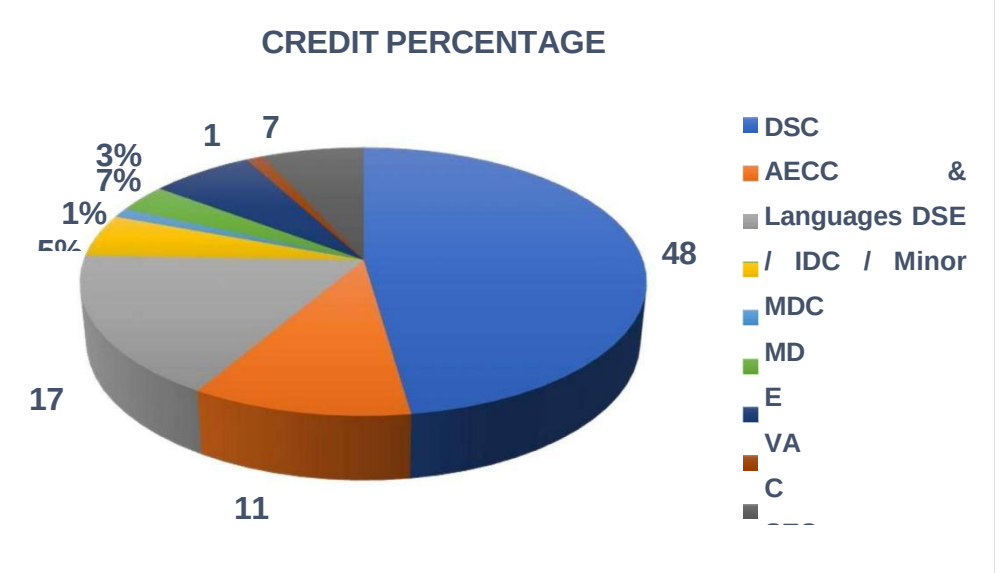
S.No	Name & Designation	Address	Role
1.	Dr. R. Sivakumar	Dean, School of Computing Sciences, VISTAS	
2.	Dr. P. Magesh Kumar	Director, School of Computing Sciences, VISTAS	Chairperson
3.	Dr.S.Gopinathan Associate Professor And Head	Department of Computer Science, University of Madras, Chennai.	External Member (Academic Expert)
4.	Mr. John Britto Chris Senior Manager-Projects	Cognizant Technologies (P) Ltd., Chennai	External Member (Academic Expert)
5.	Dr. P.Sujatha Professor and Head	Department of Information Technology, VISTAS	Internal Member
6.	Dr. T. Kamalakannan Professor	Department of Information Technology, VISTAS	Internal Member
7.	Dr. Y. Kalpana Professor	Department of Information Technology, VISTAS	Internal Member
8.	Dr. K.Rohini Professor	Department of Information Technology, VISTAS	Internal Member
9.	Dr. B.Booba Professor	Department of Information Technology, VISTAS	Internal Member
10.	Dr. R.Devi Associate Professor	Department of Information Technology, VISTAS	Internal Member
11.	Dr. K. Dharmarajan Associate Professor	Department of Information Technology, VISTAS	Internal Member
12.	Dr.S.Sathya Assistant Professor	Department of Information Technology, VISTAS	Internal Member
13.	Dr.A Vidhya Assistant Professor	Department of Information Technology, VISTAS	Internal Member
14.	Mr. PV Vishnu, Chief Innovation Officer	Xerago, Digital Impact Consulting & Services, Chennai	Alumni, VISTAS

CREDIT DISTRIBUTION

B.Sc (Hons) Information Technology
Minimum Credits to be earned: 176
B.Sc Information Technology
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	2	1	-	1	2	-	6	-	-	6
SEC	2	2	2	2	2	2	12	-	-	12
SI	-	-	1	-	1	-	2	-	-	2
RP	-	-	-	-	-	-	-	6	6	12
Total Credits	22	22	23	22	21	22	132	22	22	176





ABBREVIATIONS

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

CURRICULUM STURCTURE

B.Sc Information Technology Three Years
/
B.Sc (Hons) Information Technology Four Years

Total number of Credits: 176

	B.Sc (Hons) Information Technology Minimum Credits to be earned :176 **B.Sc Information Technology 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 / AECC	24LENG11	English I	2	0	0	1	2	40	60	100
DSC 1	24CBIT11	Problem Solving Techniques Using C	3	0	0	2	3	40	60	100
DSC 2	24CBIT12	Fundamentals of Information Technology	4	0	0	2	4	40	60	100
MDC 1	24BMA001	Mathematics- I	2	1	0	2	3	40	60	100
DSE 1/ IDC 1 / Minor 1	24DBIT1-	Discipline Specific Elective– I	3	0	0	2	3	40	60	100
DSC 1(Lab)	24PBIT11	Practical I:Problem Solving Techniques Using C Lab	0	0	2	1	1	40	60	100
VAC 1	24DVAC11	Communication Skills	2	0	0	1	2	-	100	100
SEC 1	24SSKU11	Soft Skills I	2	0	0	1	2	40	60	100
SEC 2	24SBIT11	Orientation programme/ Industrial Visit	-	-	-	-	-	-	-	-
			20	1	2	-	22	-	-	-

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/ AECC	24LENG21	English II	2	0	0	1	2	40	60	100
DSC 3	24CBIT21	Object Oriented programming with C++	3	0	0	2	3	40	60	100
DSC 4	24CBIT22	Data Structures	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	24DBIT2-	Discipline Specific Elective – II	4	0	0	2	4	40	60	100
DSC 3 (lab)	24PBIT21	Practical II : Object Oriented programming with C++	0	0	2	1	1	40	60	100
DSC 4	24PBIT22	Practical III:Data Structures lab	0	0	2	1	1	40	60	100
VAC 2	24DVAC21	Universal Human Values	1	0	0	1	1	40	60	100
SEC 3	24SSKU21	Soft Skills II	2	0	0	1	2	40	60	100
			19	**1**	**4**	**-**	**22**	-	-	-

CIA - Continuous Internal Assessment SEE - Semester End Examination

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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 /AECC	24LENG31	English III	2	0	0	1	2	40	60	100
DSC 5	24CBIT31	Programming in Java	3	0	0	2	3	40	60	100
DSC 6	24CBIT32	Web Technology	3	0	0	2	3	40	60	100
MDC 3	24EVS031	Environmental studies	3	0	0	2	3	40	60	100
DSE 3 / IDC 3 / Minor 3	24DBIT3-	Discipline Specific Elective - III	3	0	0	2	3	40	60	100
DSC 5 (lab)	24PBIT31	Practical IV : Programming in Java lab	0	0	2	2	1	40	60	100
DSC 6 (lab)	24PBIT32	Practical V :Web Technology Lab	0	0	2	2	1	40	60	100
MDE	24EMDE31	Indian Knowledge System	2	0	0	0	2	40	60	100
SEC 4	24SSKU31	Soft Skills III	2	0	0	2	2	40	60	100
SI 1	24IBIT31	Internship I	0	0	2	1	1	-	100	100
			19	**1**	**6**	**-**	**23**	**-**	**-**	**-**

CIA - Continuous Internal Assessment SEE - Semester End Examination

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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 / AECC	24LENG41	English IV	2	0	0	1	2	40	60	100
ENG / AECC	24BMA003	Statistics-I	2	1	0	2	3	40	60	100
DSC 7	24CBIT41	Python Programming	3	0	0	2	3	40	60	100
DSC 8	24CBIT42	RDBMS	3	0	0	2	3	40	60	100
DSE 4 / IDC 4 / Minor 4	24DBIT4-	Discipline Specific Elective -IV	4	0	0	2	4	40	60	100
DSC 7 (lab)	24PBIT41	Practical VI : Python Programming LAB	0	0	2	1	1	40	60	100
DSC 8 (lab)	24PBIT42	Practical VII : RDBMS LAB	0	0	2	1	1	40	60	100
SEC 5	24SBIT41	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	24SBIT42	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	24CBIT51	Software Testing	3	0	0	2	3	40	60	100
DSC 10	24CBIT52	Mobile Application Development	3	0	0	2	3	40	60	100
DSC 11	24CBIT53	Operating System	4	0	0	2	4	40	60	100
DSE 5 / IDC 5 / Minor 5	24DBIT5-	Discipline Specific Elective – V	4	0	0	2	4	40	60	100
DSC 9 (lab)	24PBIT51	Practical VIII : Software Testing lab	0	0	2	1	1	40	60	100
DSC 10 (lab)	24PBIT52	Practical IX : Mobile Application Development lab	0	0	2	1	1	40	60	100
SEC 7	24SBIT51	Entrepreneurial Development	2	0	0	1	2	40	60	100
VAC 4	24DVAC51	Value Education	2	0	0	1	2	40	60	100
SI 2	24IBIT51	Internship II	0	0	2	1	1	-	100	100
SEC 8	24SBIT52	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	24CBIT61	R-Programming	3	0	0	2	3	40	60	100
DSC 13	24CBIT62	Machine Learning	4	0	0	2	4	40	60	100
DSC 14	24CBIT63	Principles of Data Science	4	0	0	2	4	40	60	100
DSC 15	24CBIT64	Data Mining	4	0	0	2	4	40	60	100
DSE 6 / IDC 6 / Minor 6	24DBIT6-	Discipline Specific Elective– VI	4	0	0	2	4	40	60	100
DSC 12 (lab)	24PBIT61	Practical X : R-Programming lab	0	0	2	1	1	40	60	100
SEC 9	24SBIT61	Mini Project	2	0	0	2	2	-	100	100
SEC 10	24SBIT62	On Job Training / Apprenticeship / Startup	-	-	-	-	-	-	-	-
			21	**-**	**2**	**-**	**22**	-	-	-

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

***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	24CBIT71	Fundamentals of DevOps	3	0	0	2	3	40	60	100
DSC 17	24CBIT72	Cloud Computing	4	0	0	2	4	40	60	100
DSC 18	24CBIT73	Internet of Things	4	0	0	2	4	40	60	100
DSE 7 / IDC 7 / Minor 7	24DBIT7-	Discipline Specific Elective – VII	4	0	0	2	4	40	60	100
DSC 16 (lab)	24PBIT71	Practical XI: DevOps lab	0	0	2	1	1	40	60	100
RP 1	24RBIT71	Research Project I	0	0	12	2	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	24CBIT81	Natural Language Processing	3	0	0	2	3	40	60	100
DSC 20	24CBIT82	Network Security	3	0	0	2	3	40	60	100
DSC 21	24CBIT83	Intellectual Property Rights and Cyber Laws	4	0	0	2	4	40	60	100
DSE 8 / IDC 8 / Minor 8	24DBIT8-	Discipline Specific Elective – VIII	4	0	0	2	4	40	60	100
DSC 19 (Lab)	24PBIT81	Practical XII : Natural Language Processing Lab	0	0	2	1	1	40	60	100
DSC 20 (Lab)	24PBIT82	Practical XIII : Network Security Lab	0	0	2	1	1	40	60	100
RP 2	24RBIT81	Research Project II	0	0	12	2	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**

DISCIPLINE SPECIFIC CORE COURSES

Category	Code	Course	L	T	P	O	C
DSC 1	24CBIT11	Problem Solving Techniques Using C	3	0	0	2	3
DSC 2	24CBIT12	Fundamentals of Information Technology	4	0	0	2	4
DSC 1 (Lab)	24PBIT11	Practical I : Problem Solving Techniques Using C Lab	0	0	2	1	1
DSC 3	24CBIT21	Object Oriented programming with C++	3	0	0	2	3
DSC 4	24CBIT22	Data Structures	3	0	0	2	3
DSC 3 (Lab)	24PBIT21	Practical II: Object Oriented programming with C++ lab	0	0	2	1	1
DSC 4 (Lab)	24PBIT22	Practical III: Data Structures lab	0	0	2	1	1
DSC 5	24CBIT31	Programming in Java	3	0	0	2	3
DSC 6	24CBIT32	Web Technology	3	0	0	2	3
DSC 5 (Lab)	24PBIT31	Practical IV : Programming in Java lab	0	0	2	2	1
DSC 6 (Lab)	24PBIT32	Practical V: Web Technology Lab	0	0	2	2	1
DSC 7	24CBIT41	Python Programming	3	0	0	2	3
DSC 8	24CBIT42	RDBMS	3	0	0	2	3
DSC 7 (Lab)	24PBIT41	Practical VI: Python Programming LAB	0	0	2	1	1
DSC 8 (Lab)	24PBIT41	Practical VII : RDBMS LAB	3	0	0	2	3
DSC 9	24CBIT51	Software Testing	3	0	0	2	3
DSC 10	24CBIT52	Mobile Application Development	3	0	0	2	3
DSC 11	24CBIT53	Operating System	4	0	0	2	4
DSC 9 (Lab)	24PBIT51	Practical VIII: Software Testing lab	0	0	2	1	1
DSC 10 (Lab)	24PBIT52	Practical IX:Mobile Application Development lab	0	0	2	1	1

DSC 12	24CBIT61	R-Programming	3	0	0	2	3
DSC 13	24CBIT62	Machine Learning	4	0	0	2	4
DSC 14	24CBIT63	Information Security	4	0	0	2	4
DSC 15	24CBIT64	Data Mining	4	0	0	2	4
DSC 12 (Lab)	24PBIT61	Practical X: R-Programming Lab	0	0	2	2	1
DSC 16	24CBIT71	Fundamentals of DevOps	3	0	0	2	3
DSC 17	24CBIT72	Cloud Computing	4	0	0	2	4
DSC 18	24CBIT73	Internet of Things	4	0	0	2	4
DSC 16 (Lab)	24PBIT71	Practical XI : DevOps lab	0	0	2	2	1
DSC 19	24CBIT81	Natural Language Processing	3	0	0	2	3
DSC 20	24CBIT82	Network Security	3	0	0	2	3
DSC 21	24CBIT83	Intellectual Property Rights and Cyber Laws	4	0	0	2	4
DSC 19 (Lab)	24PBIT81	Practical XII:Natural Language Processing Lab	0	0	2	2	1
DSC 20 (Lab)	24PBIT82	Practical XIII:Network Security Lab	0	0	2	2	1

DISCIPLINE SPECIFIC ELECTIVE COURSES

Category	Code	Course	L	T	P	O	C
DSE 1	24DBIT11	Digital Logic Fundamentals	3	0	0	2	3
	24DBIT12	Computer Graphics					
DSE 2	24DBIT21	Computer Organization	4	0	0	2	4
	24DBIT22	Cyber Security					
DSE 3	24DBIT31	Computer Networks	3	0	0	2	3
	24DBIT32	Open Source Technology					
DSE 4	24DBIT41	Software Engineering	4	0	0	0	4
	24DBIT42	Data Visualisation					

DSE 5	24DBIT51	Artificial Intelligence	4	0	0	2	4
	24DBIT52	Software Project Management					
DSE 6	24DBIT61	Block chain Technology	4	0	0	2	4
	24DBIT62	Cryptography					
DSE 7	24DBIT71	UI/UX Design Fundamentals and Applications	4	0	0	2	4
	24DBIT72	Big Data Analytics					
DSE 8	24DBIT81	Research Methodology	4	0	0	2	4
	24DBIT82	Image Processing					

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	2	2
ENG 2	24LENG21	English II	2	0	0	2	2
LANG 3	24LTAM31/ 24LHIN31/ 24LFRE31	Tamil III / Hindi III / French III	2	0	0	2	2
ENG 3	24LENG31	English III	2	0	0	2	2
LANG 4	24LTAM41/ 24LHIN41/ 24LFRE41	Tamil-IV / Hindi-IV / French-IV	2	0	0	1	2
ENG 4	24LENG41	English-IV	2	0	0	1	2

ABILITY ENHANCEMENT COMPULSORY COURSES

Category	Code	Course	L	T	P	O	C
AECC 1	24EVS041	Environmental Studies	3	0	0	2	3

MULTIDISCIPLINARY COURSES

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

MULTIDISCIPLINARY ELECTIVES

Category	Code	Course	L	T	P	O	C
MDE	24EMDE31	Indian Knowledge System	1	1	0	0	2

VALUE ADDED COURSES

Category	Code	Course	L	T	P	O	C
VAC 1	24DVAC11	Communication Skills	2	0	0	1	2
VAC 2	24DVAC21	Universal Human Values	1	0	0	1	1
VAC 3	24DVAC41	Yoga Education / NSS / NCC	0	0	2	1	1
VAC 4	24DVAC51	Value Education	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	24SBIT11	Orientation Programme / Industrial Visit	-	-	-	-	-
SEC 3	24SSKU21	Soft Skills II	2	0	0	1	2
SEC 4	24SSKU31	Soft Skills III	2	0	0	2	2
SEC 5	24SBIT41	Industry Oriented Employability skills	1	0	2	1	2
SEC 6	24SBIT42	In-plant Training/ Industrial Tour/ Summer Term	-	-	-	-	-
SEC 7	24SBIT51	Entrepreneurial Development	2	0	0	1	2
SEC 8	24SBIT52	Skill Enhancement Training / Student Club Activities/ Institution Innovation Council Activities	-	-	-	-	-
SEC 9	24SBIT61	Mini Project	2	0	0	2	2
SEC 10	24SBIT62	On Job Training / Apprenticeship / Startup	-	-	-	-	-

SUMMER INTERNSHIP

Category	Code	Course	L	T	P	O	C
SI 1	24IBIT31	Internship I	0	0	2	1	1
SI 2	24IBIT51	Internship II	0	0	2	1	1

RESEARCH PROJECT

Category	Code	Course	L	T	P	O	C
RP 1	24RBIT71	Research Project-I	0	0	12	2	6
RP 2	24RBIT81	Research Project-II	0	0	12	2	6

SEMESTER I

24LTAM11 **TAMIL-I**

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, ஐந்திணைப் பதிப்பகம், 2001.
2. **தவறின்றித் தமிழ் எழுதுவோம்**, மா. நன்னன், ஏகம் பதிப்பகம், 1999.
3. **தவறின்றித் தமிழ் எழுத** - மருதூர் அரங்கராசன், ஐந்திணைப் பதிப்பகம், 2003.
4. **தமிழ் இலக்கிய வரலாறு**, வரதராசன், மு., புது தில்லி : சாகித்திய அக்காதெமி, 2002.
5. **புதிய தமிழ் இலக்கிய வரலாறு**, நீல. பத்மநாபன், சிற்பி பாலசுப்ரமணியம், சாகித்திய அகாடெமி, 2007.
6. **செம்மொழி தமிழின் சிறப்பியல்புகள்** - முனைவர் மறைமலை இலக்குவனார்; https://www.youtube.com/watch?v=HHZnmJb4jSY
7. **பாடநூல் தேடலுக்கான இணையம்** –
8. 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: पं. श्रीिाम शमाष कृत 'स्मृतत' (कहानी)

'Smruti' (Kahani) by Pandit Sriram Sharma. 6

UNIT II: शिद जोशी कृत 'अततति तुम कब जावोगे' (व्यंग्य)

'Athiti tum kab jaaoge' (Vyangy) by Sharad Joshi. 6

UNIT III: िाहुल सांस्कृतयायन कृत 'अिातो घुमक्कड़ जजज्ञासा' (यात्रा वृत्तान्त)

'Atatho Ghumakkad Jigyasa' (Yatra Vruthanth) by Rahul Sanskrityayan. 6

UNIT IV: व्यावहारिक हहन्दी- पत्र लेखन में प्रयुक्त वाक्यांश, कौशल ववकास

Skill development - Bhav Ek Bhasha Anek

UNIT V: पत्र लेखन – परिचय व प्रकाि, 3 अनोपचारिक पत्र

अलगी, अलगी + फ़ॉन्ट का परिचय

Letter Writing- Intro. & Types & 3 Personal Letters 6hrs. 6

Introduction to Azhagi, Azhagi + fonts

Total: 30 Hours

COURSE OUTCOMES:

At the end of this course Students will be able to

At the end of this course Students will be able to

CO1: Gain knowledge about the rural life style

CO2: Understand social values

CO3: Understand importance of varied culture

CO4: Journalise in Functional Hindi

CO5: Use Azhagi, Azhagi+ fonts

Text Books:

1. Pandit Shriram Sharma, Shikaar, Sahitya Sadan, 1932.
2. Sharad Joshi, Yatha Sambhav, Bharatiya Gyanpeet, 2014.
3. Rahul Sanskrityayan, Ghumakkad Shastra, Rajkamal Prakashan, 1949.

Reference Books:

1. Kendriya Hindi Sansthan, Banking Hindi Patyakram, 2012.
2. NCERT, Sparsh, Class 9.
3. Main Aur Mera Vyakaran, New Saraswati House, New Delhi.
4. Govind Ballabh Sharma, Hindi Vyavaharik Tankan Kala Evam Tankan Abhyas, Neelkanth Publishers Pvt. Ltd., 2022.

Web Sources:

1. Pandit Sriram Sharma ka kahani: https://www.evidyarthi.in
2. Harishankar parasayi ka Vyangy: http://gadyakosh.org
3. Rahul Sanskrityayan ka yatravruttant: https://www.hindwi.org
4. Prayojanmoolak Hindi:https://hi.mwikipedia.org
5. https://www.azhagi.com/hnd/helphtml/Introduction.html

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24LFRE1 **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 hours**

2) Enchanté

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

3) J'Adore

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

4) Tu veux bien

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

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 hours**

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 hours**

TOTAL HOURS: 30

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/ Reference Book:

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

Reference book: 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:

CO1: To enable students to develop their communication skills effectively.

CO2: To make students familiar with usage skills in the English Language.

CO3: To enrich their vocabulary in English.

CO4: To develop communicative competence.

Credit Hours

Unit I- Prose **06**

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

Unit II -Poetry **06**

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

Unit III - Short story **06**

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

Unit IV -Grammar **06**

- Parts of speech, Articles

Unit V -Grammar **06**

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

24CBIT11 PROBLEM SOLVING TECHNIQUES USING C

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVE:

1. Define and describe fundamental concepts of computers, algorithms, flowcharts and problem solving techniques.
2. Illustrate basic knowledge of mathematical factoring methods to model an algorithm, flowchart and be able to solve given problem
3. To create flowcharts and express algorithms in a language-independent way.
4. To instruct students in writing readable, modular, and efficient C programs.
5. To teach the creation and utilization of C data type arrays.
6. To explain how to use functions and recursive functions to create programme modules in C.
7. To show how to create derived data types and handle file operations.

UNIT- I INTRODUCTION & FUNDAMENTAL ALGORITHMS 9

Introduction: Programs and algorithm, The Role of Algorithms in Computing, Algorithms as a technology, analyzing algorithms, Designing algorithms, Growth of Functions.

Fundamental Algorithms: Exchanging the values of two variables, Counting, Summation of a set of numbers, Factorial Computation, Generating of the Fibonacci sequence, reversing the digits of an integer, Character to number conversion.

UNIT- II INTRODUCTION TO C PROGRAMMIMG 9

Overview of C: History and importance of C, Basic structure of C program, executing a C program. Constants, Variable and Data Types: Introduction, Character Set, C Tokens, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Assigning Values to Variables, Defining Symbolic Constants**.** Input and Output: Standard input and output, formatted output- printf, variable length argument list, formatted input-scanf.

UNIT-III CONTROL STRUCTURES 9

Control Flow: Statements and Blocks, If-else, else-if, switch, loops: while loop, for loop, do while, break and continue, goto and labels

UNIT-IV FUNCTIONS 9

Functions and category of functions, Pointers, Pointers and Arrays: pointers and address, pointers and function arguments, arrays, multidimensional array, initialization of pointer arrays, command line arguments.

UNIT– V STRUCTURES AND FILE MANAGEMENT 9

Structures: Introduction, Defining a structure, declaring structure variables, accessing structure members, structure initialization, array of structures.

File Management in C: Introduction, Defining and opening a file, closing a file, Input/output and Error Handling on Files.

Total: 45 Hours

COURSE OUTCOMES:

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

CO1: Examine the fundamental concepts of computers, algorithms, flowcharts and problem solving techniques.

CO2: Explain basic knowledge of mathematical factoring methods to model an algorithm, flowchart and be able to solve given problem.

CO3: Write, compile, and debug programmes in the C language after completing the course.

CO4: When developing a computer programme, use several data kinds.

CO5: Create programmes that use functions, arrays, loops, and decision structures.

CO6: Explain the distinction between calls made by reference and calls made by value.

CO7: Make use of pointers to comprehend memory dynamics

CO8: Generate and carry out various file operations.

Text Books:

1. E. Balaguruswamy (2019) “Programming in ANSI C”, 8th Edition, , McGraw Hill Education, ISBN: 978-93-5316-513-0

***Reference Book*:**

1. Pradip Dey, Manas Ghosh, (2018) ,Programming in C”, 2nd Edition, Oxford University Press, ISBN: 978-01-9949-147-6.
2. Kernighan B.W and Dennis M. Ritchie, (2015) “The C Programming Language”, 2nd Edition, , Pearson Education India, ISBN: 978-93-3254-944-9.
3. Yashavant P. Kanetkar, (2019) “Let Us C”, 16th Edition, BPB Publications, ISBN: 978-93- 8728-449-4.
4. Jacqueline A Jones and Keith Harrow, “Problem Solving with C”, Pearson Education. ISBN: 978-93-325-3800-9.
5. Dr. Guruprasad Nagraj, “C Programming for Problem Solving”, Himalaya Publishing House. ISBN-978-93-5299-361-1.

Web Links:

https://www.electronicshub.org/basics-of-embedded-c-program/

https://www.mygreatlearning.com/blog/embedded-c/

24CBIT12 FUNDAMENTALS OF INFORMATION TECHNOLOGY

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

- To understand core IT concepts and the importance of IT
- To develop basic skills in data management, cybersecurity, and software development.
- To gain practical experience with common software applications and troubleshooting techniques.

UNIT I COMPUTER BASICS 12

Introduction, Evolution of Computers, Generations of Computers, Classification of Computers, The Computer system, Applications of Computers. Computer organization and Architecture- Introduction, Central Processing Unit, Types of Number Systems. Computer Memory and Storage- Introduction, Memory Hierarchy. Input Output Media- Introduction.

UNIT II COMPUTER PROGRAMMING AND LANGUAGES 12

Introduction, Algorithm, Programming Paradigms, characteristics of a Good Program, Programming Languages, Generations of Programming Languages, Features of a Good Programming Language. Operating System- Introduction, Operating System Definition, Evolution of Operating System, Types of Operating Systems. Database Fundamentals- Introduction, Database Definition.

UNIT III INFORMATION TECHNOLOGY 12

Basics- Introduction, Information, Technology, Information Technology, Present scenario, Role of Information Technology, Information Technology and the Internet Multimedia- Introduction, Multimedia- definition, Multimedia Applications.

UNIT IV COMPUTER NETWORKS 12

Computer Network, Network Topologies, Network Devices Internet- Introduction, Evolution of Internet, Basic Internet Terms, and Getting connected to the Internet, Internet Applications Internet Tools- Introduction, Web Browser, Browsing Internet using Internet Explorer, E-mail Address Structure, Search engines.

UNIT V CURRENT AND FUTURE TRENDS 12

Current and Future Trends in IT- Introduction, Electronic commerce, Electronic Data Interchange, Smart card, Internet Protocol Television, Blogging, Radio Frequency Identification, Imminent Technologies.

Total: 60 Hours

COURSE OUTCOMES

On completion of this course, the students can able to,

CO1: Describe the basic components of computer hardware

CO2: Describe about basic programming

CO3: Demonstrate about IT applications

CO4: Experiment with Internet applications

CO5: Exemplify with Ecommerce

Text Book:

1. Fundamentals of Information Technology, Alexis Leon & Mathews Leon, Vikas Publisher, Second Edition.

Reference Book:

1. Peter Norton's Introduction to Computers –Second Edition
2. M.N Doja, (2005) Fundamentals of Computers and Information Technology

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 inter disciplinary 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 Hours: 45

COURSE OUTCOMES

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

CO1: Apply the concept of Matrix and solving simultaneous Equations

CO2: Understand the ideas of Sets and its applications.

CO3: Identify the relations for various functions.

CO4: Apply the concept of partial order relation for various sets.

CO5: Understand the conversion of various number system.

Textbook

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

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**

24DBIT11 DIGITAL LOGIC FUNDAMENTALS

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

- This course introduces the concepts of digital logic digital number systems and basic logic gates.
- It includes the functionality of logic gates.
- To simplify Digital Circuits, Boolean Expression, combinational and sequential circuits.
- Emphasis is placed on the use of digital applications such as programmable logic converters.

UNIT – I: Number System 9

Digital Systems, Binary Numbers, Number base conversions, Octal, Hexadecimal and other base numbers, complements, signed binary numbers, Floating point number representation, binary codes, Error detection and correction, binary storage and registers, binary logic, Boolean algebra and logic gates , Basic theorems and properties of Boolean Algebra, Boolean functions, canonical and standard forms, Digital Logic Gates.

UNIT – II: Gate–Level Minimization 9

The K-Map Method, Three-Variable Map, Four Variable Map, Five-Variable Map, sum of products, product of sums simplification, Don’t care conditions , NAND and NOR implementation and other two level implementations, Exclusive-OR function.

UNIT – III: Combinational Circuits (CC) 9

Analysis procedure, Design Procedure, Combinational circuit for different code converters and other problems, Binary Adder Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, De-multiplexers.

UNIT – IV: Synchronous Sequential Circuits 9

Latches, Flip-flops, analysis of clocked sequential circuits, Registers, Shift registers, Ripple counters, Synchronous counters, other counters. Asynchronous Sequential Circuits -Introduction, Analysis procedure, Circuits with latches, Design procedure, Reduction of state and follow tables, Race- free state assignment, Hazards.

UNIT – V: Memory **9**

Introduction, Random-Access memory, Memory decoding, ROM,Programmable Logic Array, Programmable Array Logic, Sequential programmable devices. Register Transfer and Micro operations - Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic Logic Shift Unit.

Total: 45 Hours

COURSE OUTCOMES:

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

CO1. Demonstrate the relation between various number systems and model basic functions based on Boolean algebra and logic gates

CO2. Analyze logic function using K-maps ad tabular method and develop basic combinational digital systems.

CO3. Characterize sequential circuits and design clock based registers and counters.

CO4. Design synchronous and asynchronous finite state machines.

CO5. Compare various digital logic families based on power, speed and interfacing characteristics.

CO6. Analyze working of logic families and logic gates and design the simple circuits using various gates for a given problem.

Text Book:

1. Digital Design, M. Morris Mano, M.D.Ciletti, 5th edition, Pearson
2. Computer System Architecture, M.Morris Mano, 3rd edition, Pearson.

Reference Books:

1. Switching and Finite Automata Theory, Z. Kohavi, Tata McGraw Hill.
2. Fundamentals of Logic Design, C. H. Roth, L. L. Kinney, 7th edition, Cengage Learning.
3. Fundamentals of Digital Logic & Micro Computer Design, 5TH Edition, M.

Web Links:

https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/

24DBIT12 **COMPUTER GRAPHICS**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

This Course Introduces The Concepts Of Computer Graphics And Its Components To Enrich The View Of The Image. It Also Gives An Idea About Two And Three Dimensional Modeling Concepts And Viewing Concepts.

UNIT I : INTRODUCTION TO COMPUTER GRAPHICS 9

Video Display Devices- Raster Scan Systems -Random Scan Systems - Interactive Input Devices - Hard Copy Devices - Graphics Software - Output Primitives - Line Drawing Algorithms - Initializing Lines - Line Function - Circle Generating Algorithms.

UNIT II : ATTRIBUTES OF OUTPUT PRIMITIVES 9

Line Attributes - Color And Grayscale Style - Area Filling Algorithms - Character Attributes Inquiry Functions - Two Dimensional Transformation - Basic Transformation - Composite Transformation - Matrix Representation - Other Transformations.

UNIT III : TWO - DIMENSIONAL VIEWING 9

Window- To View Port Co-Ordinate Transformation - Clipping Algorithms - Interactive Input Methods - Physical Input Devices - Logical Classification of Input Devices - Interactive Picture Construction Methods.

UNIT IV THREE - DIMENSIONAL CONCEPTS 9

Three Dimensional Display Methods - Parallel Projection - Perspective Projection - Depth Cueing - Visible Line and Surface Identification Three Dimensional Transformations.

UNIT V THREE DIMENSIONAL VIEWING 9

Projection - Viewing Transformation - Implementation of Viewing Operations - Hidden Surface and Hidden Line Removal – Back face Removals.

Total: 45 Hours

COURSE OUTCOMES:

CO-1: Understand the basics of Computer Graphics.

CO-2: Discuss various algorithms for scan conversion and filling of basic objects.

CO-3: Transformation of that images to graphics display device by 2-D Viewing.

CO-4: Explore 3-D display methods and projections techniques for display of 3D images.

CO-5: Use of projection and viewing transformation for 3-D Viewing.

Text Books:

1. Marschner, S., & Shirley, P. (2016). *Computer Graphics: Principles and Practice* (3rd ed.). Addison-Wesley.

2. Angel, E., & Shreiner, D. (2022). *Interactive Computer Graphics: A Top-Down Approach with WebGL* (8th ed.). Pearson.

Reference Books:

1.Shirley, P., Marschner, S., et al. (2024). *Fundamentals of Computer Graphics* (5th ed.). A K Peters/CRC Press.

2. Akenine-Möller, T., Haines, E., & Hoffman, N. (2018). *Real-Time Rendering* (4th ed.). A K Peters/CRC Press.

Web Reference:

1. https://www.tutorialspoint.com/computer_graphics/index.htm
2. https://www.javatpoint.com/computer-graphics-3d-graphics
3. https://www.scribd.com/doc/13702209/3D-Display-Methods

24PBIT11 PROBLEM SOLVING TECHNIQUES USING C LAB

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

- To make the student learn a programming language.
- Develop C programs using operators and conditional structures
- Write C programs using iterative structure arrays and strings
- Inscribe C programs that use Pointers to and functions
- Develop a C program for implementing user defined types and file processing

LIST OF PROGRAMS:

1) Write a C program to find sum and average of three numbers.
2) Write a C program to find the sum of individual digits of a given positive integer.
3) Write a C program to generate the first n terms of the Fibonacci sequence.
4) Write a C program to generate prime numbers between 1 to n.
5) Write a C program to Check whether given number is Armstrong Number or Not.
6) Write a C program to evaluate algebraic expression (ax+b)/(ax-b).
7) Write a C program to check whether given number is perfect number or Not.
8) Write a C program to check whether given number is strong number or not.
9) Write a C program to find the roots of a quadratic equation.
10) Write a C program perform arithmetic operations using switch statement.
11) Write a C program to perform addition of two matrices.
12) Write a C program using user defined functions to determine whether the given string is palindrome or not.
13) Write C program to count the number of lines, words and characters in a given text.
14) Write a C program to find the length of the string using Pointer.
15) Write a C Program to Calculate Total and Percentage marks of a student using structure.
16) Write a C program to copy the contents of one file to another.

Total: 15 Hours

24DVAC11 **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-I 6

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

UNIT III - EFFECTIVE COMMUNICATION MODULE-I 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

Reference Books:

- Basic communication skills for Technology, Andreja. J. Ruther Ford, 2nd Edition,PearsonEducation, 2011
- Personality development and soft skills, Barun K Mitra, 1 stEdition, Oxford Press,2011
- Elizabeth Harren, 7 April 2022, last updated: 16 November, 2023
- Kerry Patterson, Joseph Grenny, Ron McMillan, Al Switzler (McGraw-Hill)
- Ethan Beute and Stephen Pacinelli (Greenleaf)
- Soft skills and professional communication, Francis Peters SJ, 1stEdition, McGraw Hill Education, 2011

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.

Credit Hours

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
- Stress-meaning and nature, Eustress, Distress
- Stress management strategies

Total Hours **30**

Course Outcomes:

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

CO1: At the end of this course, the students would have learnt to

CO2: Demonstrate basic etiquette in various personal and professional settings.

CO3: Effectively manage stress using learned techniques.

CO4: Show increased self-awareness and make informed decisions.

CO5: Understand and articulate key 21st-century skills.

CO6: Apply creativity and critical thinking to solve problems innovatively.

References:

- Alex, Dr. K. (2014). Soft Skills (1st edition) S Chand & Company
- Taylor. Grant English Conversation Practice. Tata McGraw Hill Education Pvt. Ltd2005
- Tiko, Champa& Jaya Sasikumar. Writing with a purpose. OUP New Delhi 1979
- Nelson-Jones, R. (1992). Life skills, a handbook, Trowbridge, Wilts: Detesios Ltd.

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 செனித்தப் 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**

L	T	P	O	C
2	0	0	1	2

Prose, Official Letter Writing & Functional Hindi

COURSE OBJECTIVES:

To inculcate the human values, importance of patriotism and hard work

To train students in functional Hindi

To introduce the usage of Inscript keyboard

UNIT I : मुंशी प्रेमचंद कृत 'बूढी काकी' (कहानी)

'Boodee kaki" (Kahani) by Munshi Premchand 6hrs.

UNIT II : जयशंकि प्रसाद कृत 'पुिस्काि' (कहानी)

'Puraskar' (Kahani) by Jaishankar Prasad 6hrs.

UNIT III: हरिशंकि पिसाई कृत 'मैं निक से बोल िहा हूूँ' (व्यंग्य)

'Main Narak Se Bhol Raha Hun' (Vyangy) by 6hrs.

Harishankar Parsayi,

UNIT IV: व्यावहारिक हहन्दी 1 – 50 – तकनीहक शब्द, 50 – पदनाम व

ववभागीय नाम, भाव एक भार्ा अनेक 6hrs.

Functional Hindi 1 - 50-Technical Words, 50-Designation &

Department Names, Bhav Ek Bhasha Anek

UNIT V : व्यावहारिक हहन्दी 2 – पत्र लेखन – 3 औपचारिक पत्र,

इजन्स्िट्ट कीबोर्ष का परिचय 6hrs.

Functional Hindi 2 -Letter Writing- 3 Official Letters.

Introduction to Inscript Keyboard

Total: 30 Hours

COURSE OUTCOMES:

Course Outcome:

At the end of this course Students will be able to

CO1: Know to the human values

CO2: Know the importance of patriotism

CO3: Know the value of hardwork in human life

CO4: Journalise in Functional Hindi

CO5: Use inscript keyboard

Text Books:

1. Ed. Subhash chandar, Boodi Kaki by Premchand, Natioonal Book Trust, 2012.
2. Jaishankar Prasad, Pratinidhi Kahaniyan, Raj Kamal Prakashan, 2015.
3. Harishankar Parsai, Pratinidhi vyangy, Rajkamal, 2007.
4. Kendriya Hindi Prashikshan Sansthan, Parangat, Bharat Sarkar, 2015.

Reference books:

Kendriya Hindi Sansthan, Banking Hindi Patyakram, 2012.

Weblink:

1. Munshi Premchand, Manasarovar, 2007, http://gadyakosh.org
2. Jaishankar Prasad/ http://gadyakosh.org
3. Harishankar Parsai/ https://hindikahani.hindi-kavita.com
4. Prayojanmoolak Hindi:https://hi.mwikipedia.org
5. 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:

CO1: To read and understand different types of prose, poetry, and fiction.

CO2: To think critically about texts and express ideas clearly.

CO3: To recognize and discuss key themes and styles in literary works.

CO4: To learn and use grammar rules correctly in writing and speaking.

CO5: To write more effectively by applying grammar and literary techniques.

Credit Hours

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

24CBIT21 OBJECT ORIENTED PROGRAMMING WITH C++

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

- This course introduces basic objectives c++ and learning the difference b/w structured programming and programming and OOPs concepts.
- Creating C++ programs using Tokens, expressions and control structures in C++. Arranging same data systematically with arrays.
- How to handle Classes and objects in C++. Knowledge about the functions, Constructors and destructors Inheritance and Overloadings in C++.
- Files management and inheritance in C++. Handling exceptions to control errors.

UNIT I- INTRODUCTION 9

Need of OOPs, difference b/w structured &OOPs-Features-OOPs Features-Basic concepts of OOPs. History, Features-Rules of C++ programming-Structure of C++ program-C++ Tokens: (Identifiers, Keywords, Constants, Operators, Special characters)C++ Data types:(Basic, Derived, User defined)- Console I/O Statements(cin, cout)- Operators-Programs to implement various operators.

UNIT-II – CONTROL STRUCTURES AND ARRAYS 9

Conditional Control Statements-If-else, switch-case-Loops-While, do while, for. Implementing programs on conditional & loops-break, continue, goto keywords. Definition, advantages-Array: types-Single dimension-Double dimension-Declaration, accessing array data-Implementation of array operations

UNIT-III –FUNCTIONS AND CLASSES 9

Definition, advantages, types of functions-classification-implementing various kinds of functions-Inline functions friend function. Defining a Class, creating Objects-Accessing Data Members using objects-Calling Member Functions using objects-Implementing Array of Objects, objects as parameters & return type, new, this operators-Scope resolution operator-access specifies(private, public,protected)

UNIT -IV –INHERITANCE & OVERLOADING 9

Definition, Advantages-Types of Inheritances (Single, Hierarchical, Multilevel, Multiple Hybrid)-Implementing various constructors in inheritance-Implementing function over riding -Implementing various access levels in inheritance- What is function over loading- Definition, why it is required, advantages-About operator keyword, rules of operatoroverloading- Definition, uses-Types –Destructors.

UNIT –V –STREAMS AND EXCEPTION HANDLING 9

Streams Hierarchy-Input Streams & Output Streams-Files -Implementing various file operations on basic data types (write, read, append and modify) -Implementing various file operations on object data types (write, read, append and modify)-Random Access Files (seekp, seekg, tellp,Tellg-Exceptions-Try, catch, throw.

Total no of hours 45

COURSE OUTCOMES:

On Completion of this course, the students can able to

CO1: Develop bottom up Programming using classes & objects.

CO2: Identify the basic concepts of Object Oriented Programming

CO3: Recite the concepts to control the flow of data

CO4:. Apply the Concepts of Inline Function & Friend Function.

CO5: Analyze the role of inheritance and overloading concepts to building reusable code.

CO6: Develop the file handling and file operations.

CO7: Identify the errors and error handling operations

Text Books:

1. E.BalaGurusamy “Object Oriented Programming with C++”, Tata MC Graw Hill Education.
2. YashwantKanetkar-“Let Us C++”, 2nd edition,McGraw HillEducation,2000.

Reference Books:

1. erbert Schildt “The Complete Reference C++”, 4th edition,McGraw Hill Education,2017
2. D.Ravichandran-“Oriented Programming with C++”, 2nd edition, TMH.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

WEB SOURCES

1. https://www.tutorialspoint.com/cplusplus/cpp_tutorial.pdf
2. https://www.cplusplus.com/files/tutorial.pdf
3. https://www.slideshare.net/aloknie/oop-cclassfinalppt
4. https://www.slideshare.net/adisesha12/basic-concept-of-oops
5. https://www.slideserve.com/joan-craft/object-oriented-programming-with-c

24CBIT22 **DATA STRUCTURES**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

- This course introduces the core principles and techniques for Data structures.
- To gain experience in how to keep a data in an ordered fashion in the computer.
- To improve their programming skills using Data Structures Concepts through C++.
- To Explore basic data structures such as stacks and queues.
- Introduces a variety of data structures such as hash tables, search trees, tries, heaps, graphs. Introduces sorting and pattern matching algorithms.

Unit I: Introduction to Data Structures: 9

Classification of Data Structures, Complexity of Algorithms, Abstract Data Types Arrays, Representation of Arrays in Memory, Operations on Array, Strings and its Representation in Memory, Operations on Strings, Pointers, Sparse Matrices. Sorting: Bubble Sort, Selection Sort, and Insertion Sort. Searching: Linear Searching, Binary Searching. Implementation of Arrays, String, Sorting and Searching in C++.

Unit II: Linked Lists: 9

Introduction, Types and Operations (Insertion, Deletion, Traversal, Searching, Sorting), Applications, Dynamic Memory Management, Polynomial Representation and Addition, Implementation of Linked Representations in C++.

Unit III: Stacks & Queues: 9

Representation of Stacks, Stack Operations, Applications, Recursion, Queues, Operations on Queues, Circular Queues, Dequeue, Priority Queues, Applications, Implementation of Stacks and Queues in C++.

Unit IV: Trees 9

Definition and Basic Terminologies, Representation of Trees, Binary Trees, Types of Tree, Representation of Binary Trees, Binary Tree Traversals, Threaded Binary Trees, Binary Search Trees and Operations, AVL Trees, Heap, Heap-Sort, M-Way Search Trees, B-Trees, B+ Trees, Applications, Implementation of trees in C++.

Unit V: Graphs: **9**

Definitions and Basic Terminologies, Representation of Graphs, Graph Traversals, Operations on Graphs, Shortest Path Problem (Warshall's Algorithm and Dijkstra's Algorithm), Minimum Spanning Tree (Prim's and Kruskal's Algorithm), Applications, Implementation of Graphs using C++.Sorting and Searching: Recursive Binary Search, Types of Sorting, Implementation of Different Sorting Techniques in C++: Merge Sort, Radix Sort, Counting Sort, Bucket Sort.Hashing: Hash functions, Collision Resolution, Implementation using Linear and Quadratic Probing, Chaining using C++.

Total Hours: 45

COURSE OUTCOMES:

1. Understand and apply linear data structures-List, Stack and Queue.
2. Ability to select the data structures that efficiently model the information in a problem.
3. Apply data structures and algorithms in real time applications
4. Able to analyze the efficiency of algorithm.
5. Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
6. Implement and know the application of algorithms for sorting and pattern matching.

Text Books:

1. Fundamentals of Data Structures in C, 2 nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.

2. Data Structures using C – A. S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson Education.

Reference Book:

1. Data Structures: A Pseudocode Approach with C, 2 nd Edition, R. F. Gilberg and B.A.Forouzan, Cengage Learning.

***Web Links*:**

http://www.suite101.com/reference/data_structure_tutorial

http://warrior-101.tripod.com/dstut/dstut.htm

http://www.cplusplus.com/doc/tutorial/structures/

http://www.theparticle.com/javadata2.html

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 Hours: 45

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.

REFERENCES:

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

Website and e-Learning Source:

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:

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

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

24DBIT21 **COMPUTER ORGANIZATION**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

- To introduce the basic principles and working of computer systems
- To learn the memory system design
- To understand the I/O devices and its principles
- To provide the knowledge on instruction level parallelism

UNIT I COMPUTER DATA REPRESENTATION 12

Basic computer data types – Complements - Fixed point representation - Register Transfer and Micro-operations: Floating point representation - Register Transfer language - Register Transfer - Bus and Memory Transfers (Tree-State Bus Buffers, Memory Transfer) - Arithmetic Micro-Operations - Logic Micro Operations - Shift Micro-Operations - Arithmetic logical shift unit.

UNIT – II COMPUTER ORGANIZATION AND DESIGN 12

Instruction codes - Computer registers - computer instructions - Timing and Control - Instruction cycle- Memory-Reference Instructions – Input output and interrupt - Complete computer description - Design of Basic computer - design of Accumulator Unit.

UNIT – III PROGRAMMING THE BASIC COMPUTER 12

Introduction - Machine Language - Assembly Language – assembler - Program loops - Programming Arithmetic and logic operations – subroutines - I-O Programming - Basic Computer Organization and Design: Computer Registers - Computer instructions - Instruction cycle - Instruction codes - Timing and Control - Types of Instructions.

UNIT – IV MICRO PROGRAMMED CONTROL 12

Control Memory - Address sequencing - Micro program Example - design of control Unit - Types of Micro-programmed Control Unit - Horizontal Micro-programmed Control Unit - Vertical Micro-programmed Control Unit.

UNIT – V CENTRAL PROCESSING UNIT 12

Introduction - General Register Organization - Stack Organization - Instruction format - Addressing Modes - data transfer and manipulation - Program Control - Reduced Instruction Set Computer (RISC) Control unit design: Design approaches - Control memory - Address sequencing
- micro program example - Design of CU - Micro Programmed Control.

Total: 60

COURSE OUTCOMES:

On completion of this course, the students can be able to,

CO1: Design the architecture of modern computer
CO2: Design how the computer performs arithmetic operations on numbers.
CO3: Experiment the different register transfers
CO4: Describe the functionality of CPU and memory organization
CO5: Exemplify IO devices communication with processing unit

Text Books:

1.Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2.Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI

Reference Books:

1.“Computer Architecture and Organization”, 3rd Edition by John P. Hayes, WCB/McGraw-Hill
2.“Computer Organization and Architecture: Designing for Performance”, 10th Edition by William Stallings, Pearson Education.
3.“Computer System Design and Architecture”, 2nd Edition by Vincent P. Heuring and Harry ii. F. Jordan, Pearson Education.

Web Resources

1.https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/
2.https://www.javatpoint.com/computer-organization-and-architecture-tutorial

24DBIT22 **INTRODUCTION TO CYBER SECURITY**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

This course provides the foundation for understanding the key issues associated with protectinginformation 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 andPenetration 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.Dr. Gerald Auger, Jaclyn "Jax" Scott, Jonathan Helmus, Kim Nguyen, "Cybersecurity Career Master Plan" (2024)

Reference Books:

1.Roger Grimes (2017), "Hacking the Hacker", Wiley, Ist Edition

2. The Cybersecurity Playbook: How Every Leader and Employee Can Contribute to a Culture of Security" (2022) – J. B. Wood, Brian O'Neill

Web links

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

24PBIT21 OBJECT ORIENTED PROGRAMMING WITH C++ LAB

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

- This course introduces basic objectives to create C++ programs using Tokens, expressions and control structures in C++, Arranging same data systematically with arrays.
- How to handle Classes and objects in C++. Knowledge about the functions, Constructors and destructors in C++.
- Files management and inheritance in C++. Handling exceptions to control errors.

LIST OF EXPERIMENTS:

1. Write a C++ program to demonstrate Control Structures
2. Write a C++ program to calculate Simple interest using class and Object
3. Write a C++ program to sort given numbers in Ascending Order using Bubble sort
4. Write a C++ program to manipulate a given string
5. Write a C++ program to demonstrate function overloading
6. Write a C++ program to demonstrate Inline and friend function
7. Write a C++ program to demonstrate Swap using call-by-value
8. Write a C++ program to demonstrate Mathematical functions
9. Write a C++ program to demonstrate Constructor and Destructor
10. Write a C++ program to demonstrate Operator Overloading
11. Write a C++ program to demonstrate Single Inheritance
12. Write a C++ program to demonstrate Multi level Inheritance
13. Write a C++ program to demonstrate Multiple Inheritance
14. Write a C++ program to demonstrate virtual function
15. Write a C++ program to demonstrate Exception handling

Total: 15 Hours

COURSE OUTCOMES:

On Completion of this course, the students can able to

CO1: Develop the Virtual Functions and File handling operations

CO2: Write C++ Programs using Classes & objects.

CO3: Build programs on Constructors, Destructors and Overloading concepts using programs.

CO4: Manipulate the role of inheritance in building reusable code and I/O operations.

CO5: State the OOP's concepts in writing simple C++ Programs.

CO6: Discriminate the concept of call by value and call by reference

CO7: Analyze the concepts of Exception handling.

Text Books:

1) E.BalaGurusamy "Object Oriented Programming with C++", Tata MC Graw Hill Education.
2) YashwantKanetkar-"Let Us C++", 2nd edition,McGraw HillEducation,2000.

Reference Books:

1. Herbert Schildt "The Complete Reference C++", 4th edition,McGraw Hill Education,2017
2. D.Ravichandran-"Oriented Programming with C++", 2nd edition, TMH.

Websites

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

Web Sources

1. https://www.tutorialspoint.com/cplusplus/cpp_tutorial.pdf
2. https://www.cplusplus.com/files/tutorial.pdf
3. https://www.slideshare.net/aloknie/oop-cclassfinalppt
4. https://www.slideshare.net/adisesha12/basic-concept-of-oops
5. https://www.slideserve.com/joan-craft/object-oriented-programming-with-c

24PBIT22 **DATA STRUCTURES LAB**

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

- This laboratory course enable students to get practical experience in design, develop, implement, analyze and evaluation/testing of Asymptotic performance of algorithms.
- To implement Linear data structures and their applications such as Stacks, Queues and Lists.
- To implement non-Linear Data Structures and their Applications such as Trees and Graphs Sorting and Searching Algorithms

LIST OF PROGRAMS:

1. Array implementation of Stack, Queue and Circular Queue ADTs
2. Implementation of Singly Linked List
3. Linked list implementation of Stack and Linear Queue ADTs
4. Implementation of Polynomial Manipulation using Linked list
5. Implementation of Evaluating Postfix Expressions, Infix to Postfix conversion
6. Implementation of Binary Search Trees
7. Implementation of AVL Trees
8. Implementation of Heaps using Priority Queues
9. Implementation of Dijkstras Algorithm
10. Implementation of Prims Algorithm
11. Implementation of Linear Search and Binary Search
12. Implementation of Insertion Sort and Selection Sort
13. Implementation of Merge Sort
14. Implementation of Open Addressing (Linear Probing and Quadratic Probing)

Total: 15 Hours

Text Books:

1. Fundamentals of Data Structures in C, 2 nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.
2. Data Structures using C – A. S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson Education.

Reference Book:

Data Structures: A Pseudocode Approach with C, 2 nd Edition, R. F. Gilberg and B.A.Forouzan, Cengage Learning.

Web Links:

http://www.suite101.com/reference/data_structure_tutorial

24DVAC21 **UNIVERSAL HUMAN VALUES**

L	T	P	O	C
1	0	0	1	1

COURSE OBJECTIVE:

- The candidates will be able to appreciate the complementary 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 Outcome:

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: Ek Parichaya . (1999).
2. Rakesh Gupta. (2008). Jeevan Vidya: 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.

24SSKU21 **SOFT SKILLS -II**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

- To enable participants' Social skills
- To enable participants Etiquettes
- To impact leadership, Decision-making, Behaviour and team bonding skills

Credit Hours

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 student will be able to

CO1: Understand the principles of effective team building and apply strategies to foster team bonding and cohesion in professional settings.

C02: 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.

References:

1. Language Service, University at Oberta de Catalunya
2. Taylor. Grant English Conversation Practice. Tata McGraw Hill Education Pvt. Ltd 2005
3. Tiko, Champa& Jaya Sasikumar. Writing with a purpose. OUP New Delhi 1979
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.

SEMESTER III

24LTAM31 **TAMIL III**

L	T	P	O	C
2	0	0	1	2

சிற்றிலக்கியம். சிறுகதை, எழுதுதிறன், பேச்சுக்கலை

பாடத்திட்ட நோக்கம்:

மாணவர்களின் இலக்கிய நாட்டத்தை மேம்படுத்துதல், பக்தி இலக்கியத்தை மாணவர்களுக்கு அறிமுகப்படுத்தி, அதன்வழி தமிழர்தம் பக்தி உணர்வையும் அதன் மேன்மையையும், கலைத்திறனையும் வெளிப்படுத்துதல், காப்பியம், புதினம் என்ற இலக்கிய வகைமைகளை அறிமுகப்படுத்துதல், மாணவர்களின் மொழித்திறனை மேம்படுத்தும் வகையில் மொழிபெயர்ப்பு, இலக்கணக் குறிப்பு என்பனவற்றை அறியச் செய்தல், மேற்கண்டவழி மாணவர்களைப் போட்டித்தேர்வுகளுக்குத் தயார் செய்தல் இந்தப் பாடத்திட்டத்தின் முக்கிய நோக்கமாகும்.

அலகு 1: சிற்றிலக்கியம் 8 மணி நேரம்

1. நந்திக்கலம்பகம் - உரைவரம் பிகந்த உயர்புகழ்ப்
   வானுறுமதியை அடைந்தது உன்வதனம்
2. தமிழ்விடு தூது – 10 கண்ணிகள்
3. திருக்குற்றாலக் குறவஞ்சி – மலைவளம் கூறுதல் – முதல் 5 பாடல்கள்
4. கலிங்கத்துப் பரணி – பாலை பாடியது – முதல் 5 பாடல்கள்

அலகு 2: சிறுகதை 8 மணிநேரம்

1. அறிஞர் அண்ணா - செவ்வாழை
2. புதுமைப்பித்தன் - கடவுளும் கந்தசாமிப் பிள்ளையும்
3. கி.ராஜநாராயணன் - கதவு

அலகு 3 எழுதுதிறன் 7 மணி நேரம்

கலைச்சொல்லாக்கம் - தேவைகள் - கலைச்சொற்களின் பண்புகள் - கலைச்சொல்லாக்கத்தில் தவிர்க்க வேண்டியவை - அறிவியல் கலைச்சொற்கள்.கடிதம் - வகைகள் - அலுவலகக் கடிதங்கள் - பயிற்சி - அறிஞர்களின் கடிதங்கள் - கடிதங்களின் வழி கற்பித்தல் - சில அறிஞர்களின்

கடிதங்கள் - நேரு...,

அலகு 4: பேச்சுக் கலை 8 மணி நேரம்

பேச்சுத் திறன் – விளக்கம் – பேச்சுத்திறனின் அடிப்படைகள் – வகைகள் – மேடைப்பேச்சு – உடையாடல் - பயிற்சிகள்

மொத்தம்: 30 மணி நேரம்

பார்வை நூல்கள்

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

24LHIN31 **HINDI-III**

L	T	P	O	C
2	0	0	1	2

(Ancient & Medival Poetry, Hindi translation & Advertisement)

COURSE OBJECTIVES:

To enrich the knowledge of students about through Thirukkural

To enable them to learn life values through ancient and medievial poems of Hindi Literature

To develop translation and advertisements skills in Hindi

UNIT I : ततरुवल्लुवि कृत ततरुक्कुिल – 5, अमीिि खुसिो कृत पहेतलयाूँ - 5

'Thirukkural'- 5 Kural-by Thiruvalluvar **6**

Amir Khusro-5 Paheliyan

UNIT II: कबीिि के दोहे – 5

Kabir Ke Dohe,-5 **6**

UNIT III: तुलसीदास के पद – 2 & सूिदास के पद – 2

Tulsidas Ke Pad-2 & SurdasKe Pad-2 **6**

UNIT IV: व्यावहारिक हहन्दी 1 – अनुवाद का परिचय (अिष, परिभार्ा व प्रकाि) & 5 - अभ्यास अनुछेद

Functional Hindi 1 - Introduction to Translation (Meaning, Definition &Types) & Exercise passages – 5 **6**

. UNIT V: व्यावहारिक हहन्दी 2 - ववज्ञापन का परिचय (अिष, परिभार्ा व प्रकाि) & 4 – नमूना ववज्ञापन 6hrs.

Advertisement –Introduction (Meaning, Definition & Types) & Model Advertisement - 4 **6**

Total :30 Hours

COURSE OUTCOMES:

At the end of this course Students will

CO1: Know the valuable messages in social responsibilities

CO2 & CO3: Know the life values

CO4 : Gain knowledge of translation in functional Hindi

CO5 : Gain knowledge about advertisement skills in Hindi

Text Books:

1. Thirukkural, Bharatiya Gyanpeet, 2014.
2. Amir Khusro Ki Paheliyan, Prakrit Bharati Acadamy, 2006.
3. Amar Prakash, Kahir Dohavali, Mahamaya Publication, 2020.
4. Tulsidas, Dohavali, Geeta Press, Gorakhpur.
5. Vagdev, Surdas Ke Padavali, Prabhat Prakashan, 2011.

Reference book:

1. Rachana Vyas, Amir Khusro Ki Paheliyan, Lokoday Prakashan Pvt. Ltd., 2022.
2. Kendriya Hindi Sansthan, Banking Hindi Patyakram, 2012.
3. Kendriya Hindi Prashikshan Sansthan, Parangat, Bharat Sarkar, 2015.

Weblinks:

1. Thirukkural hindi translation by Venkata Krishnan
2. Ameer khusro ki paheliyan - https://www.hktbharat.com
3. Kabir ke Dohe - Kabir granthavali , Surhranthavali-http://kavitakosh.org
4. Tulsidas ke pad - http://kavitakosh.org

24LFRE31 **FRENCH-III**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

The lessons are being chosen:
1) to express certainty and uncertainty
2) to express one's desire to do something
3) to express one's willingness and unwillingness to do something
4) to express one's joy and sorrow
5) to express one's fear, concern and astonishment
6) to express one's anger and regrets

	6
1) Très drôle le passe recent, passe compose et l'imparfait	
2) Vous avez dit culture l'interrogation et le subjonctif.	**5**
3) Envie d'ailleurs les verbes aller/ retourner, venir/ revenir, ne...pas...ni, ne…ni…ni.	**4**
4) Voila l'été le comparatif, superlatif et l'accord du participe passe avec avoir.	**7**
5) Terre inconnue le plus-que parfait	**3**
6) Vivement dimanche le pronom en et y, le subjonctif et les conjugaisons irrégulières.	**5**

Total :30 Hours

COURSE OUTCOMES:

1) The students would be able to express certainty and uncertainty
2) The students would be able to express one's desire to do something
3) The students would be able to express one's willingness and unwillingness to do something
4) The students would be able to express one's joy and sorrow
5) The students would be able to express one's fear, concern and astonishment
6) The students would be able to express one's anger and regrets

Text/Reference book/Weblinks:

Prescribed book: LATITUDES 1 (A2/B1) MÉTHODE DE FRANÇAIS - Régine Mérieux and Yves Loiseau
Reference book: SAISON A2 - MÉTHODE DE FRANÇAIS - Marie-Noëlle Cocton, Élodie Heu, Catherine Houssa, Émilie Kasazian

24LENG31 **ENGLISH III**

L	T	P	O	C
2	0	0	1	2

ENGLISH FOR COMPETITIVE EXAMINATIONS

Course Objectives:

CO1: To enhance reading comprehension skills for understanding complex texts in competitive exams.

CO2: To develop vocabulary and language proficiency to tackle verbal reasoning sections effectively.

CO3: To improve grammar and writing skills for precise and coherent expression in competitive exams.

CO4: To practice critical thinking and analytical reasoning abilities required for exam questions.

CO5: To familiarize students with exam formats, strategies, and time management techniques for success in competitive exams

Unit I -Vocabulary 6

- Homophones, Homonyms, Note-taking, Paraphrasing

Unit II - Comprehension 6

- Reading comprehension, Critical reading, Cloze test

Unit III - Grammar 6

- Idioms and Phrases, Question tag, Verbal phrases, Prepositions

Unit IV - Grammar 6

- Voices, Direct & Indirect speech, Simple, Compound, Complex

Unit V - Academic Writing 6

- Precis writing, Report writing

TOTAL: 30 HOURS

COURSE OUTCOMES:

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

CO1 : Students imbibe the rules of language unconsciously and tune in to deduce language structure and usage

CO2 : Students develop their abilities as critical readers and writers

CO3 : Students decipher the mechanism of language and use it for success in competitive examinations and job related speaking and writing tasks.

REFERENCES:

1) General English for competitive examinations by V. Rajagopalan (McGraw Hill Education) -2010.

2) Technical Communication – Principles and Practices By Meenakshi Raman & Sangeeta

3) K. Sharma, Oxford Univ. Press, 2016, New Delhi.

24CBIT31 PROGRAMMING IN JAVA

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVE

- To make students familiar with object-oriented programming concepts.
- Java programming can be used to develop both web-based & console based Application & stand-alone application
- Java is one of the top most languages used in most of the IT companies. It is a job assured course.

UNIT I INTRODUCTION TO JAVA 9

Introduction to Java – Features of Java – Object Oriented Concepts – Lexical Issues – Data Types – Variables – Arrays – Operators – Control Statements.

UNIT II CLASSES & OBJECTS 9

Classes – Objects – Constructors – Overloading methods – Static and fixed methods – Inner Classes – String Class – Inheritance – Overriding methods – Using super – Abstract class.

UNIT III PACKAGES 9

Packages – Access Protection – Importing packages – Exception Handling – Throw and Throws and finally– Nested try– Multiple catch statements– Creating user defined exceptions– Thread – Synchronizing – Runnable Interface – Multithreading.

UNIT IV INPUT/OUTPUT STREAMS 9

I/O streams –File Streams- String Buffer–Char Array–Java Utility classes–Calendar–Date– Random– Scanner–Timer–Vector.

UNIT V AWT 9

AWT - AWT Hierarchy– AWT Containers –AWT Components– Working with windows using AWT Classes– Event Handling in AWT– Layout Managers and Menus – Graphics in AWT.

Total No of Hrs: 45

COURSE OUTCOME

On Completion of this course, the students can able to

CO1: Build programs using AWT classes and utilize Controls and Layout Managers
CO2: Write a computer program to solve specified problems and use Java SDK Environment to create, debug and run simple java programs
CO3: Develop the Java Classes make use of Constructors and Inheritance
CO4: Analyze the packages and classify the thread communication
CO5: Describe java features and explain the supporting OOPs concepts

TEXT BOOKS

1. Balaguruswamy E. (2023). Programming with JAVA: A Primer. 7th edition. India: McGraw Hill Education
2. Schildt, H. (2022). Java: The Complete Reference. 12th edition.McGraw-Hill Education

REFERENCE BOOKS

1. Arunesh Goyal, The Essentials of JAVA, Khanna Book Publishing Company Private Limited, 2012.
2. Tanweer Alam, Core JAVA, Khanna Book Publishing Company Private Limited, 2015.
3. Y. Daniel Liang, Introduction to Java Programming, 7th Edition, Pearson,2008.
4. S. Malhotra and S. Choudhary, Programming in Java, 2nd Edition, Oxford University Press, 2014.

WEBSITES

1) www.w3schools.com
2) www.tutorialspoint.com
3) www.javapoint.com
4) www.geeksforgeeks.org

WEB SOURCES

1. https://www.tutorialspoint.com/java/java_tutorial.pdf
2. https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf
3. https://www.slideshare.net/intelligotech/java-tutorial-ppt-7189933
4. https://www.slideshare.net/VeerabadraBadra/introduction-to-java-9266993

24PBIT32 **WEB TECHNOLOGY**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVE:

On completion of this course, a student will be familiar with client server architecture and able to develop a web application using java technologies.

1. Students will gain the skills and project-based experience needed for entry into web application and development careers
3. Understand best technologies for solving web client/server problems
4. Use Java script for dynamic effects and to validate form input entry
5. Analyze to Use appropriate client-side or Server-side applications

UNIT I HTML 9

Internet Basic – Introduction to HTML – PRE- List: Ordered and unordered- Creating Table – Linking document – How to work efficiently with images in web pages, image maps, GIF animation, adding multimedia -Frames -Graphics to HTML Doc – -Forms.

UNIT II STYLE SHEET 9

Sheet basics – Adding style to document – Creating style sheet rules – Why we use CSS- adding CSS to your web pages- Grouping styles – Style Sheet Types :Inline Style sheet – External Style Sheet-Import Style Sheet – Style Sheet Properties: Font , Text , Background & Color , Margin , Padding , Border & Box , Display.

UNIT III XML & DHTML 9

XML & DHTML: -extensible markup language (XML). Dynamic HTML: Document object model (DCOM)-Accessing HTML & CSS through DCOM Dynamic content styles & positioning-Event bubbling-data binding..

UNIT IV JAVASCRIPT 9

Introduction to JavaScript –Advantage of JavaScript – JavaScript syntax – Data type –Variable –Array – Operator and Expression – Looping Constructor – Function – Dialog box-JavaScript document object model – Introduction – object in HTML – Event Handling –Window object – Document object – Browser Object – Form Object – Navigator object –Screen object –Build in object – User defined object – Cookies

UNIT V AJAX 9

Ajax: Introduction, advantages &disadvantages, Purpose of it, Ajax based web application, alternatives of Ajax Java Script & AJAX: Introduction to array-operators, making statements-date & time-mathematics-strings-Event handling-form properties. AJAX. Introduction to jQuery and AngularJS

Total No of Hrs: 45

COURSE OUTCOME

On completion of this course, the students can able to, CO1: Create Static web sites using HTML & CSS.
CO2: Design dynamic and interactive web pages by embedding Java Script.
CO3: Analyze the usage different technologies such as XML & AJAX. CO4: Understand the concept of Cookies.
CO5: Remember basic tags and Properties in HTML, CSS, Java Script, and XML &Ajax.

TEXT BOOKS:

1.Bayross, Web Enable Commercial Application Development Using HTML, DHTML,JavaScript, Perl CGI, BPB Publications.
2.HTML Complete Reference.

REFERENCE BOOKS:

1.Jaworski, Mastering JavaScript, BPB Publications, 2006
2.DT Editorial Services (Author), "HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)", Paperback 2016, 2nd Edition.

WEBSOURCES:

1.www.w3schools.com 2.www.tutorialspoint.com
3.www.javapoint.com 4.www.geeksforgeeks.org

24EVS031 **ENVIRONMENTAL STUDIES**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES

CO1: To understand the significance of ecosystems and biodiversity, and explore strategies for conservation.

CO2: To identify the causes and impacts of environmental pollution and evaluate waste management practices.

CO3: To Integrate sustainability concepts into business and organizational practices

CO4: To recognize the relationship between humans and the environment and address sustainability challenges.

Unit 1: 9 hours

Introduces basic environmental principles, the man-environment relationship, and sustainability issues.

Unit 2: 9 hours

Focuses on ecosystems, biodiversity, and sustainable practices.

Unit 3 : 9 hours

Addresses environmental pollution, waste management, and sustainable development strategies. Finally,

Unit 4: 9 hours

Explores social issues, environmental legislation, and practical applications through hands-on fieldwork. Through this holistic approach, students will gain a deep understanding of environmental processes,

Unit 5: 9 hours

The importance of sustainable practices, and their role in promoting sustainability within business contexts.

Total 45 hours

COURSE OUTCOMES

1) To Explain key environmental principles,
2) Analyze ecosystem functions and biodiversity conservation strategies to foster sustainability.
3) Evaluate environmental pollution sources, impacts, and waste management techniques to mitigate adverse effects.
4) Interpret social issues and environmental policies and apply this knowledge to solve real-world environmental challenges through fieldwork.

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.
7. Roy, M. G. Sustainable Development: Environment, Energy and Water Resources. Ane Books.

WEBLINKS

https://www.ourplanet.com

https://www.undp.org/content/undp/en/home/sustainable-development-goals.html

www.myfootprint.org

https://www.globalchange.umich.edu/globalchange1/current/lectures/kling/ecosystem/ecosystem.html

24DBIT31 **COMPUTER NETWORKS**

L	T	P	O	C
3	0	0	2	3

Course Objectives:

CO1: To Understand the fundamental concepts of Computer Networks and their applications.
CO2: To Describe about the basic concepts of layered model, protocols and interworking between computer networks and switching components in telecommunication systems.
CO3: To enhance the modern networking technology skills.
CO4: To Develop problem-solving skills related to network design, implementation, and troubleshooting.
CO5: To Implement network protocols and configure network devices.

UNIT I: INTRODUCTION TO COMPUTER NETWORKS **9**

Overview of Computer Networks: Definition and Objectives - Network criteria - Categories of Network, Distributed processing, Protocol, Standards, Standard organizations.

UNIT II: NETWORK MODELS **9**

The OSI reference model, peer-to-peer processes, Functions of the layers in the OSI model, TCP/IP protocol suite.

UNIT III: MEDIA AND TRANSMISSION MODES **9**

Transmission mode, Digital data transmission, DTE/DCE interface, Modems, Guided Media and Unguided Media.

UNIT IV: NETWORK TOPOLOGIES, ERRORS DETECTION AND CORRECTION **9**

Line Configuration, computer network topologies, Types of errors, Error Detection, Error Corrections.

UNIT V: SWITCHING AND ROUTING **9**

Multiplexing, Types of Multiplexing, Switching - Circuit Switching - Packet Switching - Message switching, Networking and Internetworking devices, Routing and routing algorithm types.

Total No of Hours **45**

COURSE OUTCOMES:

On completion of this course, the students will be able to

CO1: Understand basic computer network technologies and protocols.

CO2: Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

CO3: Understand the rudiments of how computers communicate and their functions within a network

CO4: Identify the different types of network topologies.

CO5: Understand the basic aspects of packet-based design and implementation and familiar with modern communication systems.

TEXT BOOKS:

1. Computer Network Applications using Game TheoryComputer Network Applications By Dr. T.P. Anithaashri · 2024.

2. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach", 8th Edition, Pearson, 2021.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, "Data Communications and Networking", 5th Edition, McGraw-Hill Education, 2012.

2. Larry L. Peterson and Bruce S. Davie, "Computer Networks: A Systems Approach", 6th Edition, Morgan Kaufmann, 2019.

3. Bhavneet Sidhu, An Integrated Approach to Computer Networks, Khanna Publishing House, 2023.

4. Mastering PC Hardware & Networking, Khanna Publishing House, 2024.

WEB RESOURCES:

www.w3schools.com

www.tutorialspoint.com

www.javapoint.com

www.geeksforgeeks.org

24DBIT32 **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.

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. Open Source Software: The Secret to Effective Digital Transformation by O'Reilly Media (2024),

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.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

24PBIT31 PROGRAMMING IN JAVA LAB

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVE:

• To make students familiar with oops & applet programming
• Java programming can be used to develop both web based & console based application & stand-alone application
• Java is one of the top most languages used in most of the IT companies. It is a job assured course.

LIST OF PROGRAMS

1. Area of shapes using Overloading/Overriding/Interface concepts.
2. Substring Removal from a String.
3. Determining the order of numbers generated randomly using Random Class.
4. Usage of Calendar Class and its manipulation.
5. String Manipulation using built-in functions.
6. Usage of Vector Classes.
7. Implementation of Thread based application.
8. Implementation of Exception Handling.
9. Working with Frames and various controls to prepare a Bio-data form.
10. Working with Dialogs and Menus.
11. Working with Panels and Layouts.
12. Working with Colors and Fonts.

TOTAL:15 HOURS

COURSE OUTCOME

On Completion of this course, the students can able to
CO1: Build programs using AWT classes and utilize Controls and Layout Managers
CO2: Write a computer program to solve specified problems and use Java SDK Environment to create, debug and run simple java programs
CO3: Develop the Java Classes make use of Constructors and Inheritance
CO4: Develop the packages and classify the thread communication
CO5: Develop simple java application using java features and OOPs concepts

TEXT BOOKS

Cay S.Horstmann, Gary Cornell-Core Java 2 Volume 1 – Fundamentals,5th PHI,2000.

E.Balaguruswamy, ”Programming with JAVA”,3rd edition ,Tata McGraw- Hill Publications, 2007.

REFERENCE BOOKS

1. K.Arnold and J.Gosling- The Java Programming Language – Second Edition,Addison Wesley,2002.
2. P.Naughton and H.Schildt –Java2 (The Complete References)-Seventh Edition,TMH 2004.

WEBSITES

www.w3schools.com
www.tutorialspoint.com
www.javapoint.com
www.geeksforgeeks.org

WEB SOURCES

https://www.tutorialspoint.com/java/java_tutorial.pdf
https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf
https://www.slideshare.net/intelligotech/java-tutorial-ppt-7189933
https://www.slideshare.net/VeerabadraBadra/introduction-to-java-9266993

24PBIT32 **WEB TECHNOLOGY LAB**

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVE

To impart the knowledge of basic concepts and coding of HTML, Java script and CSS. This course elaborates internet related technologies to design a creative and dynamic website in a systematic way

LIST OF PROGRAMS

HTML

1. Table Handling
2. Designing Time Table
3. Designing an index of a book using ordered and unordered List
4. Designing an index of a book using Nesting of List
5. To scroll an image over a screen
6. Create a web page to link two or more pages.
7. Create a web page to advertise a product using Frames and Links
8. Create a Bio-data using Form tag.

CASCADING STYLE SHEET

1. Create an External Style Sheet using Font, Text and Color Properties
2. Create an Internal Style Sheet using Font, Text and Color Properties and Border Properties
3. Create an Inline Style Sheet using Font, Text , Color and Background Properties

JAVA SCRIPT

1. Simple Calculator
2. String Object
3. Array Object
4. Math Object
5. Screen Object
6. Navigator Object
7. Closing a window after a minute
8. Working with OnMouseOver Event.

Total No of Hrs: 15

COURSE OUTCOME

On completion of this course, the students can able to,

CO1: Design Static web sites using HTML & CSS.

CO2: Design dynamic and interactive web pages by embedding Java Script

CO3: Experiment the different technologies such as XML & AJAX.

CO4: Implement the concept of Cookies.

CO5: Describe the basic tags and Properties in HTML, CSS, Java Script, and XML & Ajax.

TEXT BOOKS

1. Bayross, Web Enable Commercial Application Development Using HTML, DHTML,JavaScript, Perl CGI, BPB Publications.
2. HTML Complete Reference.

REFERENCE BOOKS

1. Jaworski, Mastering JavaScript, BPB Publications, 2006
2. DT Editorial Services (Author), "HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)", Paperback 2016, 2nd Edition.

WEBSITES

1.www.w3schools.com

2.www.tutorialspoint.com

3.www.javapoint.com

4. www.geeksforgeeks.org

WEB SOURCES

https://www.darshan.ac.in/Upload/DIET/Documents/CE/2160708_Web%20Technology%20Study%20Material%20GTU_23042016_032646AM.pdf

https://www.vssut.ac.in/lecture_notes/lecture1423183400.pdf

https://www.webstepbook.com/supplements/slides/ch10-ajax_xml.pdf

https://www.lamsade.dauphine.fr/~mlampis/EAPPS/lec2/js-slides.pdf

24EMDE31 **INDIAN KNOWLEDGE SYSTEM**

L	T	P	O	C
2	0	0	0	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 a sholistic health, governance, public administration and sustainable living.
- To Promote the youths to do research in the various fields of Indian knowledge system.

Unit1: An Overview of Indian Knowledge System 6

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

Unit 2: Philosophical system 6

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

Unit 3 : Governance and Public Administration 6

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

Unit 4 : Wisdom through the Ages 6

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 5 Mathematics 6

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

Total 30 hours

COURSE OUTCOMES:

CO1 : Classify the key concepts of Indian Knowledge System and discuss the multi-faceted nature of knowledge contained in the Traditional Systems of India.

CO2 : Identify the rich heritage of governance in Indian Knowledge System.

CO3 : Recognize the relevance of Arthash astra in public administration.

CO4 :Identify the Wisdom through Ages through Ithihasas.

CO5 : Knowledge of Indian Mathematicians and their contributions.

Text Books:

1. Mahadevan B., Bhat V R, Nagendra Pavana R.N., Indian Knowledge System Concepts andApplication, PHI Learning Pvt. Ltd., 2022.
2. Kapoor Kapil, and Singh Avadesh Kumar, Indian Knowledge System Vol.1, DK Print World,Ltd., 2005.

Reference Books

1. Textbook on 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

Weblink:

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

24SSKU13 **SOFT SKILLS –III**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

CO1: To hone the creative and critical faculties of learners.

CO2: To enhance descriptive and narrative skills through short story creation.

CO3: To acquire professional reports and review writing skills for various mediums.

CO4: To gain practical writing skills for television, radio, magazines, and the web, emphasizing freelance opportunities.

Credits

Hours

Unit I 6

Meaning and Significance of Creative

Writing, Refining Vocabulary, Word order,

Developing Hints

Unit II Writing Skills 6

Genres of Writing

Descriptive Passages, Short Stories, Narration of incidents

Unit III Academic Writing 6

Report Writing, Writing of book reviews and film reviews

Unit IV Writing for Media 6

Writing for TV, Radio and Magazine, Freelance Writing, Preparation of Web Content

Unit V Advertisement Writing 6

Types of advertising and advertising media, Writing techniques

Ineffective advertisement, Code of ethics for advertisement

Advertising and marketing.

Total Hours 30

COURSE OUTCOMES:

At the end of this course, the students would have learnt to CO1: craft rhymes, free verse, jokes, and articles proficiently

CO2: create descriptive passages and short stories to exhibit their creative writing prowess.

CO3: write informative reviews and structured reports for diverse media.

CO4: create compelling content for various platforms, adhering to ethical standards in advertising and marketing principles.

References:

1.Creative Writing Log by Swan, published by Emerald in 2009.

2.Creative Writing by Isabelle Krishnan, published by Fairfield in 2013. The Practice of Writing by David Lodge, published by Vintage in 2011

24IBIT31 **INTERNSHIP-I**

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

The internship aims to:

1. Provide hands-on experience with software development, programming, and problem-solving.
2. Expose participants to real-world IT workflows, software life cycles, and project management.
3. Enhance understanding of core computer science domains such as data structures, algorithms, and system design.
4. Develop skills in emerging technologies like cloud computing, machine learning, and cybersecurity.
5. Build teamwork, communication, and technical documentation abilities.

COURSE MODULES

Module 1: Introduction to Software Development

- Overview of SDLC
- Tools for Software Development (e.g., Git, JIRA, IDEs)
- Agile and Scrum Methodologies

Module 2: Programming Fundamentals and Development

- Review of Core Programming Languages (C++, Java, Python, etc.)
- Hands-on: Developing Algorithms and Solving Problems
- Working with APIs and Libraries

Module 3: Web and Mobile Application Development

- Basics of Web Technologies (HTML, CSS, JavaScript)
- Backend Development (Node.js, Django, or Flask)
- Mobile App Development (Flutter or React Native)
- Hands-on: Developing a Full-Stack Application

Module 4: Data Structures and Algorithms

- Problem Solving with Data Structures (Arrays, Trees, Graphs, etc.)
- Algorithmic Techniques (Sorting, Searching, Dynamic Programming)
- Competitive Programming Exercises

Module 5: Database Design and Management

- Relational Databases (SQL) and NoSQL Databases (MongoDB)
- Database Modeling and Normalization
- Hands-on: Building and Querying Databases

Module 6: Emerging Technologies

- Basics of Cloud Computing (Azure, AWS, or Google Cloud)
- Introduction to Machine Learning and AI
- Cybersecurity Essentials
- Hands-on: Implementing Cloud or ML Features in a Project

Module 7: Final Project

- Selection of a Domain-Specific Problem (E.g., E-Commerce, IoT Integration)
- Team Collaboration and Milestone Planning
- Project Development, Testing, and Deployment
- Final Presentation and Documentation

Total: 15 Hours

COURSE OUTCOMES:

Upon completion of this internship, participants will be able to:

CO1: Apply computer science concepts to real-world problems effectively.

CO2: Develop, test, and deploy software applications.

CO3: Demonstrate proficiency in programming languages and frameworks used in the internship.

CO4: Understand and contribute to software development lifecycle (SDLC) processes.

CO5: Work collaboratively on team projects, using agile or other methodologies.

CO6: Present technical findings and document project outcomes effectively.

SEMESTER IV

24LTAM41 **TAMIL IV**

L	T	P	O	C
2	0	0	1	2

மரபுக்கவிதை,புதுக்கவிதை,ஊடகத்தமிழ்,கணினித்தமிழ்

பாடத்திட்ட நோக்கம்:

தமிழர்தம் தொன்மைச் சிறப்பையும், பண்பாட்டுச் செழுமையையும் உலகிற்குப் பறைசாற்றும் சங்க இலக்கியங்களான எட்டுத்தொகை, பத்துப்பாட்டு நூல்களை அறியச் செய்தல், அதன்வழி பண்டைத் தமிழரின் விழுமியங்களை எடுத்துரைத்தல், இலக்கால இலக்கிய வகைமையான நாடக இலக்கியத்தை அறியச் செய்தல், ஊடகங்களில் தமிழின் பயன்பாடு, கணினியில் தமிழ்ப்பயன்பாடு என்பனவற்றை மாணவர்களுக்கு கற்றுக்கொடுத்தல், மாணவர்களை ஆளுமை மிக்கவர்களாக உருவாக்கி, போட்டித்தேர்வுகளுக்குத் தயார் செய்தல் என்பன இந்தப் பாடத்திட்டத்தின் முக்கிய நோக்கமாகும்.

அலகு 1: மரபுக்கவிதை 8 மணி நேரம்

1. பாரதியார் - பாரத தேசம் என்னும் தலைப்பில் ஆறு பாடல்கள்.
   (பாடல் எண்கள் 1, 6, 7, 9, 12, 13)
2. பாரதிதாசன் – தமிழுக்கும் அமுதென்று பேர் என்னும் தலைப்பிலான கவிதை.
3. தேசிக விநாயகம் பிள்ளை - உடல் நலம் பேணல் என்னும் தலைப்பிலான கவிதை
4. முடியரசன் - காவியப் பாவை – “புண்படுமா” என்னும் கவிதை.

அலகு 2: புதுக்கவிதை 8 மணி நேரம்

1. நா. காமராசன் - *கறுப்பு மலர்கள்* தொகுப்பில் *காகிதப்பூக்கள்* என்னும் தலைப்பிலான கவிதை.
2. அப்துல் ரகுமான் - *ஆலாபனை* தொகுப்பில் *போட்டி* என்னும் தலைப்பிலான கவிதை

3. ஆண்டாள் பிரியதர்ஷினி – *முத்தங்கள் தீர்ந்துவிட்டன* தொகுப்பில் *'இங்கே வரும் போது'* என்னும் தலைப்பிலான கவிதை

அலகு 3 :ஊடகத் தமிழ் **7 மணி நேரம்**

இதழியல் - ஊடக வகைகள் - தலையங்கம்- நிகழ்ச்சியை செய்தியாக மாற்றுதல்- கருத்துப் பரிமாற்றம் நாடகம், திரைப்படம்,- வானொலி- தொலைக்காட்சி- மொழி நடையின் தன்மை -

அலகு 4 : கணினித் தமிழ் **7 மணி நேரம்**

கணினித் தமிழ்: கணினித் தமிழின் அடிப்படையும் பயன்பாடும் - கணிப்பொறியின் வரலாறும் வளர்ச்சியும், கணினியும் தமிழும், விசைப்பலகை (Keyboard) - எழுத்துருக்கள் (Fonts) - தமிழைத் தட்டச்சு செய்ய உதவும் மென்பொருள்கள், தமிழைத் தட்டச்சு செய்யும் முறைகள் - தமிழ்த் தட்டச்சுப் பயிற்சி - இணையமும் தமிழ்ப் பயன்பாடும் - தேடுபொறி (Search) - வலைப்பூ (Blog), மின்னூலகம் (Online e-Library), - மின்னகராதி(e-Dictionary), - மின் செய்தித்தாள் - e-Paper, - இணையவழித் தமிழ்க் கற்றலும்-கற்பித்தலும் - மின்வழிக் கற்றல் - e Learning.

மொத்தம்: 30 மணி நேரம்

பார்வை நூல்கள்

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

24LHIN41 **HINDI-IV**

L	T	P	O	C
2	0	0	1	2

(Medival & Modern Poetry, Translation)

COURSE OBJECTIVES:

- To develop interest in various style of Modern and Contemporary Hindi Poetry
- To enable them to know about the Official Language Hindi
- To enable them to converse in Hindi

UNIT I : भाितेन्दु हरिश्चंद्र की मुखरियाूँ – 4

Bharatendu Harishchandra ki Mukhariyan-4. 6

UNIT II : सुतमत्रानंदन पंत कृत 'भाितमाता ग्रामवासी' (कववता)

'Bharatmata Gramavasi' (Kavita) by Sumitranand Pant 6

UNIT III: ज्ञानेन्द्रपतत कृत 'बीज व्यिा' (कववता)

'Beej Vyatha' (Kavita) by Gyanendrapati 6

UNIT IV: ि◌ाजभार्◌ा हहन्दी का परिचय, अनुछेद से प्रश्न तनमाषण

Introduction to Official Language Hindi, framing questions from passages 6

UNIT V : मंच संचालन (साक्षात्काि◌) का परिचय

Introduction to Stage Management(Interview) 6

Total : 30 hours

COURSE OUTCOMES:

At the end of this course Students will be able to

CO1 CO2 & CO3 : Familiar with the different poetic expressions of Modern & Contemporary Hindi Poetry

CO4 : Know the importance of official language Hindi

CO5 : Become conversant in Hindi

Text Books

1. Bhartendu Harishchandra, Ed.Ramji Yadav, Bharatendu Sanchayan, Bharatiya Pustak Parishad, 2011.
2. Sumitranandan Pant, Gramya, Lokbharti Prakashan, 2017.
3. Gyanedrapati, Gyanendrapati, Prabhakar Publication, 2022.
4. Bhatia Kailashchandra, Rajbhasha Hindi, Vani Prakashan,2018.

Reference Book

1. Mahesh Sharma, Bhashan Kala, Prabhat Prakashan, 2019.
2. Raghavan T.E.S. Rajbhasha Hindi Amarkosh.

Weblinks:

1. http://kavitakosh.org
2. Bharatendu Harishchandra
3. https://www.amarujala.com/kavya/kavya-charcha/bhartendu-harishchandra-poems-naye-jamane-ki-mukariyan?page=5
4. Sumitranandan Pant- http://kavitakosh.org
5. https://www.hindiadda.com/beej-vyatha-gyanendrapati/
6. Hindi Rajbhasha: https://navodaya.gov.in

24LHIN41 **FRENCH-IV**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

The lessons are being chosen:

1) to propose to do something and respond to a proposal

2) to respond to a request

3) to accuse, to blame

4) to complain, to protest

5) to express cause and consequence

6) to express opinion about facts

Units:

1. Entreprendre

Les pronoms démonstratifs, les pronoms interrogatifs. **6**

2. Vous avez gagne

Les pronoms en et y, les formation des adverbes en-ment **5**

3. Ne quittez pas

La mise en relief (c'est ..... qui, c'est …….que). **4**

4. Argent trop cher

l'opposition- toujours/ne…jamais. **4**

5. Le pétrole fou

la cause et la consequence. **5**

6. Parlez-moi d'amour

le conditionnel present, le gérondif. **6**

Total : 30 hours

COURSE OUTCOMES:

1) The students would be able to propose to do something and respond to a proposal
2) The students would be able to respond to a request
3) The students would be able to accuse, to blame
4) The students would be able to complain, to protest
5) The students would be able to express cause and consequence
6) The students would be able to express opinion about facts

Text/Reference Book/Weblinks:

1) Prescribed book: LATITUDES 1 (A2/B1) MÉTHODE DE FRANÇAIS - Régine Mérieux and Yves Loiseau
2) Reference book: SAISON A2 - MÉTHODE DE FRANÇAIS - Marie-Noëlle Cocton, Élodie Heu, Catherine Houssa, Émilie Kasazian

24LENG41 **ENGLISH – IV**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

CO1: To develop effective oral communication skills for professional contexts such as presentations and meetings.

CO2: To enhance written communication abilities, including business correspondence and reports.

CO3: To improve professional vocabulary and language usage appropriate for various fields and industries.

CO4: To practice critical thinking and problem-solving skills through case studies and discussions.

CO5: To prepare students for job interviews, networking, and career advancement through professional English proficiency.

Credit Hours

Unit I - Technical Writing **6**

- Spelling, Punctuation, Spot the error
- Hints development,
- Cliches, Redundancies
- Modifiers.

Unit II - Creative Writing **6**

- Instructions and recommendations
- Interpretation of graphs, charts and pictures

Unit III - Professional Writing **6**

- Agenda
- Minutes of the meeting
- Review
- Circular

Unit IV - Organization of Writing **6**

- Paragraph Writing
- Essay writing
- Proposal Writing

Unit V - Speech Writing **6**

- Welcome address
- Vote of thanks
- Oral presentation
- E-mail and SMS text.

Total 30 hours

COURSE OUTCOMES:

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

C01 : Demonstrate proficiency in language use.

CO2: Master the nuances of Spoken and Written Communication skills in professional contexts.

CO3: Develop confidence and clarity in Professional English usage.

REFERENCES:

- Professional English by Meenakshi Raman and Sangeetha Sharma -2018.
- General English for all competitive examinations by S.C. Gupta -2016.

24BMA003 **STATISTICS-I**

L	T	P	O	C
2	1	0	2	3

COURSE OBJECTIVE:

To develop the skills of the students in the concepts of Statistics and Design of Experiments. The course will also serve as a prerequisite for post graduate and specialized studies and research.

UNIT 1: Measures of Central tendency and Dispersion 9

Introduction – Scope and Limitations of Statistical methods Measures of Central tendency: Mean, Median, Mode. Measures of Dispersion- Range, Quartile Deviation, Mean Deviation, Standard Deviation and Coefficient of variation.

UNIT II: Correlation and Regression Analysis 9

Introduction – Correlation: Types of Correlation, Scatter diagram method, Karl Pearson's Coefficient of correlation, Spearman's Rank Correlation Coefficient.Regression: Regression Lines and Regression equations and simple problems.

UNIT III: Testing of Hypothesis 9

Introduction – Concept of Sampling and Sampling Distribution- Standard error – Tests of Significance for small samples: Student's Distribution : Single- two sample and paired t-test, The F-test(variance – Ratio test) , Chi-Square tests for Goodness of Fit and test for independence of attributes in contingency table.

UNIT IV: Probability 9

Introduction to Probability- Different approaches of Probability-Addition theorem, Multiplication theorem-Conditional probability- Baye's theorem.

UNIT V: Probability Distribution 9

Introduction – Discrete distribution : Binomial distribution , Poisson distribution, Geometric distribution. Continuous distribution : Exponential distribution , Uniform distribution , Normal distribution.

Total: 45 Hours

Text Books:

1. S.P. Gupta, Statistical Methods, 44th Edition, Sultan Chand & Sons,2014.

Reference Books:

1. P.R. Vittal and V. Malini, Statistical and Numerical Methods, Margham Publications,1st Edition,2007.

2. S.C. Gupta and V.K. Kapoor, Fundamentals of Applied Statistics, Sultan Chand & Sons, 3rd Edition, 2001.

3. Beri G, Business Statistics, Tata McGraw Hill Publishing Company Limited, 2009.

24CBIT41 **PYTHON PROGRAMMING**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVE:

To introduce the basics of Python programming and its historical significance, features, and applications. To familiarize students with Python syntax, including literals, constants, variables, keywords, and built-in data types.

To develop skills in implementing control statements, loops, and jump statements to solve logical problems.

To explore the concepts of functions, string manipulations, and modular programming for reusable and efficient coding.

To understand Python's built-in data structures like lists, tuples, and dictionaries, and their practical uses.

Unit I : Basics of Python Programming 9

History of Python-Features of Python-Literal -Constants-Variables - Identifiers–Keywords-Built-in Data Types-Output Statements – Input Statements-Comments – Indentation-Operators-Expressions -Type conversions. Python Arrays: Defining and Processing Arrays – Array methods.

Unit II: Control Statements 9

Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. Jump Statements: break, continue and pass statements.

Unit III: Functions 9

Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. Function Arguments: Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments- Recursion. Python Strings: String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. Modules: import statement- The Python module – dir() function – Modules and Namespace – Defining our own modules

Unit IV : Lists: **9**

Creating a list -Access values in List-Updating values in Lists-Nested lists - Basic list operations- List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples– Difference between lists and tuples. Dictionaries: Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.

Unit V : Python File Handling **9**

Types of files in Python - Opening and Closing files Reading and Writing files: write() and writelines() methods- append() method – read() and readlines() methods – with keyword – Splitting words – File methods - File Positions- Renaming and deleting files

Total: 45 hours

COURSE OUTCOMES

Upon successful completion of this course, students will be able to:

1. To Understand the fundamental concepts of Python programming, including syntax, variables, operators, and data types.
2. To Demonstrate the ability to write Python programs using control structures like conditional statements and loops.
3. To Apply functions, recursion, and modules to build modular, efficient, and reusable Python code.
4. To Manipulate strings, lists, tuples, and dictionaries to implement data-centric solutions effectively.
5. To Develop programs for handling files, performing data I/O operations, and managing file resources.
6. To Solve computational problems by applying the concepts of Python programming in various real- world scenarios.

Text Books:

1. Venkatesh, Nagaraju Y, Introduction to Python Programming, Khanna Publishing House, 2021.
2. Jeeva Jose, Introduction to Computing & Problem Solving With PYTHON, Khanna Publishing House, 2023.
3. Sheetal Taneja & Naveen kumar: Python Programming a Modular approach – A Modular approach with Graphics, Database, Mobile and Web applications, Pearson, 2017.

Reference Books:

1. Think Python, by Allen Downey, 2 nd edition, 2015, O'Reilly. https://drive.google.com/file/d/1p9Pul6d5UvnQrO9-Q-LE2_p4YvMk5cIg/view
2. An introduction to Python for absolute beginners, by Bob Dowling, Cambridge Univ.
3. Introduction to Computation and Programming using Python, by John Guttag, 2 nd edition, 2016, PHI India.

Web Resources:

1. https://www.learnpython.org/
2. https://www.w3schools.com/python/default.asp

24CBIT42 RELATIONAL DATA BASE MANAGEMENT SYSTEMS

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVE

- To provide students with a clear understanding of the principles and architecture of relational database management systems
- To enable students to write and execute SQL commands for database creation, manipulation, and querying
- To train students in designing optimized and normalized database schemas using techniques like ER modeling, normalization, and functional dependencies, ensuring efficiency and data integrity.
- To introduce the concepts of transaction management, ACID properties, concurrency control, and recovery mechanisms.
- To expose students to advanced RDBMS features such as stored procedures, triggers, and distributed databases, and to introduce NoSQL databases.

Unit I: Introduction to RDBMS 9

Basics of Database Systems:Definition of Data, Database, and Database Management Systems,Advantages of DBMS over traditional file systems.

Introduction to RDBMS: Concepts and Architecture ,Data Models: Hierarchical, Network, and Relational Models,Keys: Primary Key, Foreign Key, Candidate Key, and Composite Key,Codd's Rules for RDBMS,Introduction to Entity-Relationship (ER) Model.

Unit II: SQL - Structured Query Language 9

Basic SQL Commands:DDL (Data Definition Language): CREATE, ALTER, DROP-DML (Data Manipulation Language): INSERT, UPDATE, DELETE-DCL (Data Control Language): GRANT, REVOKE

Advanced SQL Concepts:SQL Functions: Aggregate Functions (SUM, AVG), String Functions, Date Functions- Subqueries, Joins (INNER, OUTER, CROSS), and Set Operations (UNION, INTERSECT)-Constraints: NOT NULL, UNIQUE, CHECK, DEFAULT, and FOREIGN KEY-Views, Indexes, and Sequences

Unit III: Relational Database Design 9

Normalization and Denormalization: Need for Normalization-Normal Forms: 1NF, 2NF, 3NF, BCNF

Functional Dependencies and Multivalued Dependencies-Decomposition and Lossless Join-Denormalization and its Impact on Performance

Database Design Process: Mapping ER Model to Relational Model-Design Considerations.

Unit IV: Transaction Management and Concurrency Control 9

Transaction Concepts:ACID Properties (Atomicity, Consistency, Isolation, Durability)-States of a Transaction **Concurrency Control:**Problems in Concurrent Transactions: Lost Updates, Dirty Reads, and Uncommitted Data- Locking Mechanisms: Shared and Exclusive Locks-Deadlock Handling: Detection and Prevention-Timestamp-based and Multi-Version Concurrency Control

Recovery Systems:Log-based Recovery: Undo and Redo-Checkpoints and Shadow Paging

Unit V: Advanced RDBMS and NoSQL Databases 9

Advanced Topics in RDBMS:Stored Procedures, Functions, and Triggers-Cursor Management and Optimization- Distributed Databases and Client-Server Architecture

Introduction to NoSQL Databases: Difference Between RDBMS and NoSQL-Types of NoSQL Databases: Document, Key-Value, Column-Family, Graph Databases-Basic Operations in NoSQL-Use Cases and Limitations of NoSQL

Total: 45 hours

COURSE OUTCOMES

Students will be able to

1. To explain the architecture, features, and principles of relational database management systems
2. To demonstrate the ability to write and execute SQL queries for creating, modifying, and querying relational databases efficiently using DDL, DML, and DCL commands.
3. To design normalized database schemas, effectively map ER models to relational models.
4. To understand and apply concepts of transaction management, concurrency control, and recovery mechanisms
5. To understand and apply concepts of transaction management, concurrency control, and recovery mechanism

Text Books

1. Raghu Ramakrishnan, Johannes Gehrke, “Database Management Systems”, third edition, McGraw – Hill, 2018
2. Benjamin Rosenzweig, Elena Rakhimov, “Oracle PL/SQL by Example”, fifth edition, Prentice Hall, 2015
3. Brad Dayley, “NoSQL with MongoDB in 24 Hours”, 1st edition, Sams Publishing, 2024

Reference Books

1. Korth, Silbertz, Sudarshan,” Database System Concepts”, Seventh Edition, McGraw - Hill.(2019)
2. R.P. Mahapatra, Govind Verma, “Database Management Systems”, Khanna Publishing House, 2025.

Web Resources

1. https://oracle-base.com/articles
2. https://forums.oracle.com/ords/apexds/domain/dev- community/category/sql_and_pl_sql
3. https://asktom.oracle.com/ords/f?p=100:1:0

24DBIT41 **SOFTWARE ENGINEERING**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVE

- To understand the fundamental concepts of software engineering and the evolution of software development methodologies.
- To explore various software development life cycle models and their applications in real-world projects.
- To analyze and gather software requirements and develop comprehensive specifications.
- To introduce software design principles and structured modeling techniques, including function- oriented and object-oriented approaches.
- To understand object modeling concepts using UML and apply these techniques to design systems.
- To study coding standards, testing techniques, and strategies for ensuring the quality of software systems.

UNIT- I **12 hours**

Introduction – Evolution – Software Development projects – Emergence of Software Engineering. Software Life cycle models – Waterfall model – Rapid Application Development – Agile Model – Spiral Model

UNIT- II **12 hours**

Requirement Analysis and Specification – Gathering and Analysis – SRS – Formal System Specification

UNIT- III **12 hours**

Software Design – Overview – Characteristics – Cohesion & Coupling – Layered design – Approaches Function Oriented Design – Structured Analysis – DFD – Structured Design – Detailed design.

UNIT- IV **12 hours**

Object Modeling using UML – OO concepts – UML – Diagrams – Use case, Class, Interaction, Activity, State Chart – Postscript

UNIT- V **12 hours**

Coding & Testing – coding – Review – Documentation – Testing – Black-box, White-box, Integration, OO Testing, Smoke testing.

TOTAL: 60 HOURS

COURSE OUTCOME

CO1: Explain the evolution of software engineering and its importance in developing robust software systems. **CO2**: Apply various software life cycle models to manage and execute software development projects effectively. **CO3**: Conduct requirement analysis and create detailed Software Requirement Specification (SRS) documents.

CO4: Design software solutions using structured techniques, considering cohesion, coupling, and layered design principles.

CO5: Develop and represent object-oriented models of software systems using UML diagrams.

Text Books

1. Software Engineering, N.S. Gill, Khanna Publishing House, 2023
(AICTERecommended Textbook)
2.Software Engineering, Ian Somerville, 9th edition, Pearson education.
3.Software Engineering A practitioner's Approach, 8th edition, Roger S Pressman, Bruce R. Maxim. McGraw Hill Education, 2015.

Reference Books

1. Stephen Schach, Software Engineering 7th ed, McGraw-Hill, 2007
2. Software Engineering: Principles and Practice Hans van Vliet

24DBIT42 **DATA VISUALIZATION**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

To understand the concepts of different types of visualization and how humans perceive information. Learn the processes, mechanics in implementing principles of design and color to make effective visualizations, learn how to visualize graphs, be exposed to visualization dashboards, and to apply techniques from user-interface design to create an effective visualization system.

UNIT I: THE COMPUTER AND THE HUMAN 9

Defining data visualization - Visualization workflow-describing data visualization- Work flow process in practice

UNIT II: VISUALIZATION OF NUMERICAL DATA 9

Data Representation: chart types: categorical, hierarchical, relational, temporal & spatial; 2-D: bar charts, Clustered bar charts, dot plots, connected dot plots, pictograms, proportional shape charts, bubble charts, radar charts, polar charts, Range chart.

UNIT III: VISUALIZATION OF NON-NUMERICAL DATA 9

Range chart, Box-and-whisker plots, univariate scatter plots, histograms word cloud, pie chart, waffle chart, stacked bar chart, back-to-back bar chart.

UNIT IV: VISUALIZATION DASHBOARD 9

Visualization system for large datasets and dashboards, Tools for dashboard, graph data visualization; Annotation.

UNIT V: 2-D & 3-D DATA VISUALISATION 9

Relevant 2-D charts. 3-D: surfaces, contours, hidden surfaces, 3d coloring, 3D mapping: multi dimensional data visualization.

TOTAL: 45 Hours

COURSE OUTCOMES:

On Completion of this course, the students can able to

CO1: Discuss the concepts of what data visualization is, how it's used, and how Computers display information.

CO2: Implement principles of design and color to make data visualizations more Effective

CO3: Learn how to visualize graphs that depict relationships between data items.

CO4: Use and designing own visualization system for large datasets and dashboards

CO5: To interpret 2D and 3D visualization system.

Text Books:

1. Andy Kirk, Data Visualization A Handbook for Data Driven Design, Sage Publications, 2016

2. "Storytelling with Data: A Data Visualization Guide for Business Professionals" Cole Nussbaumer Knaflic, Wiley; 1st edition, 2015.

Reference Books:

1. "Data Visualization: A Practical Introduction" Kieran Healy, Princeton University Press, 2018.

2. "Analyzing Data with Power BI and Power Pivot for Excel", Alberto Ferrari and Marco Russo, Microsoft Press; 1st edition, 2017.

3. "Microsoft Power BI Complete Reference", Devin Knight, Brian Knight, Mitchell Pearson, and Manuel Quintana, Packt Publishing; 1st edition, 2018.

Web links

1. https://www.geeksforgeeks.org/introduction-to-data-visualisation

24PBIT41 **PYTHON PROGRAMMING LAB**

L	T	P	O	C
0	0	2	1	1

COURSE OUTCOMES

CO1: Familiarize with Python Programming Environment CO2: Apply Fundamental Programming Concepts
CO3: Work with Python Data Structures CO4: Design Modular and Reusable Code

LIST OF EXPERIMENTS

1. Compute the GCD of two numbers.
2. Find the square root of a number (Newton's method)
3. Find the maximum of a list of numbers
4. Exponentiation (power of a number)
5. Selection sort, Insertion sort
6. How to create, slice, change, delete and index elements using Tuple.
7. How to change, delete, add and remove elements in Dictionary
8. Find the most frequent words in a text read from a file.
9. Find First n prime numbers.
10. Programs that take command line arguments (word count)

TOTAL:15 HOURS

Reference Books

1.Think Python, by Allen Downey, 2nd edition, 2015, O'Reilly.https://drive.google.com/file/d/1p9Pul6d5UvnQrO9-Q-LE2_p4YvMk5cIg/view

2.An introduction to Python for absolute beginners, by Bob Dowling, Cambridge Univ.

3.Introduction to Computation and Programming using Python, by John Guttag, 2nd edition,2016, PHI India.

Web Resources

1. https://www.learnpython.org/
2. https://www.w3schools.com/python/default.asp

24PBIT42 **RDBMS LAB**

L	T	P	O	C
0	0	2	1	1

COURSE OUTCOMES

1. CO1: Apply basic database creation techniques
2. CO2: Design and implement relational databases
3. CO3: Write and optimize SQL queries

LIST OF EXPERIMENTS

1. Table creation, Renaming a Table, Copying another table, Dropping a Table Table Description: Describing.
2. Table Definitions, Modifying Tables, Joining tables, Number and Date functions.
3. SQL Queries: Queries, Sub Queries, and Aggregate functions
4. DDL: Experiments using database DDL SQL statements
5. DML: Experiment using database DML SQL statements
6. DCL: Experiment using database DCL SQL statements
7. Index : Experiment using database index creation, Renaming a index, Copying another index, Dropping a index
8. Views: Create Views, Partition and locks
9. Cursor: PL/SQL Procedure for application using cursors
10. Trigger: PL/SQL Procedure for application using triggers

TOTAL:15 HOURS

Reference Books

1.Ben Forta"SQL Fundamentals and Basics"5th Edition (2023,Sams Publishing

James R. Groff, Paul N. Weinberg, Andy Oppel"Comprehensive SQL Reference"3rd Edition (2022), McGraw Hill Education publication.

2.Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database Management Systems" 7th Edition (2019),McGraw Hill Education

Web Resources

1.https://www.w3schools.com/sql/sql_create_table.asp

2.https://www.w3schools.com/sql/sql_drop_table.asp

24SBIT41 INDUSTRY ORIENTED EMPLOYABILITY SKILLS

(CAREER SKILLS)

L	T	P	O	C
1	0	2	1	2

COURSE OBJECTIVES

- To develop practical job search strategies, including resume writing and interviewing skills.
- To enhance communication and presentation skills for professional environments.
- To cultivate teamwork and collaboration abilities through group projects and activities.
- To build problem-solving and critical thinking skills applicable to real-world industry scenarios.
- To understand and adapt to workplace ethics, culture, and professional behaviour.

Unit I - Employee/Employer Expectations **6**

- Loyalty, Growth Chart
- Hierarchy – Escalation Matrix

Unit II - Current Affairs & GK **6**

- Technology, Sports
- National Politics
- International Affairs

Unit III - Job Preparedness **6**

- Bio-data, Resume, CV
- Social Media –Professional Presence (LinkedIn, FB, Instagram, Twitter)
- Cover Letter.

Unit IV - Interview Skills **6**

- Types of Interviews
- Dress Code & Attire
- Group Discussion
- Self Selling

Unit V - Practical & Project **6**

- Mock GD – Mock Interview
- Individual project presentation – viva voce

Total 30 hours

COURSE OUTCOMES:

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

CO1: Effectively create resumes and perform well in job interviews.

CO2: Demonstrate strong communication and presentation skills in professional settings.

CO3 : Efficiently in teams and collaborate on projects.

CO4 : Apply problem-solving and critical thinking skills to industry-related challenges.

CO5 : Understand and exhibit appropriate workplace ethics and professional behaviour.

Text/Reference Books:

1. "Cracking the Coding Interview: 189 Programming Questions and Solutions" by Gayle McDowell

2. "What to Say in Every Job Interview: Word-for-Word Scripts for Acing the Interview" by Don Georgevich

3. "The Art of Interviewing: How to Ace Your Next Job Interview" by Peter Roberts

24SNSS41 **NATIONAL SERVICE SCHEME**

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

The National Service Scheme (NSS) is a student volunteer program aimed at developing a sense of social responsibility among students while also contributing to the welfare of the community. It help students to connect with their communities, gain practical life skills, and contribute meaningfully to society.

UNIT I : ENVIRONMENT ISSUES 6

Environment conservation, enrichment and Sustainability - Climate change - Waste management - Natural resource management - (Rain water harvesting, energy conservation, waste land development, soil conservations and afforestation)

UNIT II : DISASTER MANAGEMENT 6

Introduction to Disaster Management, classification of disasters - Role of youth in Disaster Management

UNIT III : PROJECT CYCLE MANAGEMENT 6

Project planning - Project implementation - Project monitoring - Project evaluation : impact assessment

UNIT IV : DOCUMENTATION AND REPORTING 6

Collection and analysis of date - Preparation of documentation/reports - Dissemination of documents/reports

UNIT V : PROJECT WORK/ PRACTICAL 6

Workshops/seminars on personality development and improvement of communication skills.

Total: 30 Hours

Text Books:

1. ChhatrapatiShahu – The Pillar of Social Democracy,Ed.P.B.Salunkhe.
2. National Service Scheme Manual, Govt.of India.

Reference Books:

1. KapilK.Krishan, Social service opportunities in Hospitals, TISS.
2. J.B.Reddy, Women and Law.

SEMESTER V

24CBIT51 **SOFTWARE TESTING**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVE:

- Define and describe fundamental concepts of software testing
- To understand the basics of software testing
- To learn how to do the testing and planning effectively
- To build test cases and execute them
- To focus on wide aspects of testing and understanding multiple facets of testing
- To get an insight about test automation and the tools used for test automation

UNIT- I FOUNDATIONS OF SOFTWARE TESTING 9

Introduction: Why do we test Software?, Black-Box Testing and White-Box Testing, Software Testing Life Cycle, V- model of Software Testing, Program Correctness and Verification, Reliability versus Safety, Failures, Errors and Faults (Defects), Software Testing Principles, Program Inspections, Stages of Testing: Unit Testing, Integration Testing, System Testing

UNIT- II TEST PLANNING 9

The Goal of Test Planning, High Level Expectations, Intergroup Responsibilities, Test Phases, Test Strategy, Resource Requirements, Tester Assignments, Test Schedule, Test Cases, Bug Reporting, Metrics and Statistics.

UNIT-III TEST DESIGN AND EXECUTION 9

Test Objective Identification, Test Design Factors, and requirement identification, Testable Requirements, Modeling a Test Design Process, Modeling Test Results, Boundary Value Testing, Equivalence Class Testing, Path Testing, and Data Flow Testing.

UNIT-IV ADVANCED TESTING CONCEPTS 9

Performance Testing: Load Testing, Stress Testing, Volume Testing, Fail-Over Testing, Recovery Testing, Configuration Testing, Compatibility Testing, Usability Testing, Testing the Documentation, Security testing, testing in the Agile Environment, Testing Web and Mobile Applications.

UNIT– V TEST AUTOMATION AND TOOLS 9

Automated Software Testing, Automate Testing of Web Applications, Selenium: Introducing Web Driver and Web Elements, Locating Web Elements, Actions on Web Elements, Different Web Drivers, Understanding Web Driver Events, Testing: Understanding Testing.xml, Adding Classes, Packages, Methods to Test, Test Reports.

Total: 45 Hours

COURSE OUTCOMES:

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

CO1: Examine the fundamental concepts of testing.

CO2: Understand the need for software testing.

CO3: Design Test planning and diff erent activities involved in test planning.

CO4: Design effective test cases that can uncover critical defects in the application.

CO5: Carry out advanced types of testing.

CO6: Automate the software testing using Selenium Testing.

CO7: Generate Test Reports.

Text Books:

1. Yogesh Singh, “Software Testing”, Cambridge University Press, 2012
2. Unmesh Gundecha, Satya Avasarala, "Selenium WebDriver 3 Practical Guide" – Second Edition 2018.

Reference Book:

1. Glenford J. Myers, Corey Sandler, Tom Badgett, The Art of Software Testing, 3rd Edition,2012, John Wiley & Sons, Inc.
2. Ron Patton, Software testing, 2nd Edition, 2006, Sams Publishing.Paul C. Jorgensen, Software Testing:A Craftsman’s Approach, Fourth Edition, 2014, Taylor & Francis Group
3. Carl Cocchiaro, Selenium Framework Design in Data-Driven Testing, 2018, Packt Publishing.
4. Satya Avasarala, Selenium WebDriver Practical Guide, 2014, Packt Publishing.
5. Varun Menon, TestNg Beginner's Guide, 2013, Packt Publishing.
6. Elfriede Dustin, Thom Garrett, Bernie Gaurf, Implementing Automated Software Testing, 2009, Pearson Education, Inc.

Web Links:

1. https://aif.org/wp-content/uploads/2018/10/Software-Testing-Trng-Module-2018a_MAST.pdf
2. https://ix.cs.uoregon.edu/~michal/book/Samples/book.pdf
3. https://www.tutorialspoint.com/software_testing/software_testing_tutorial_in_pdf.htm
4. https://ix.cs.uoregon.edu/~michal/book/Samples/book.pd

24CBIT52 MOBILE APPLICATION DEVELOPMENT

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

- To understand core mobile application development concepts and the importance
- To develop basic skills in mobile application development
- To capture User-interface design, basics of graphics and multimedia.
- To gain practical experience with common software applications and troubleshooting techniques.

UNIT I MOBILE APP BASICS **9**

Mobile Application Development - Mobile Applications and Device Platforms - Alternatives for Building Mobile Apps -Comparing Native versus Hybrid Applications .The Mobile Application Development Lifecycle-The Mobile Application Front-End-The Mobile Application Back-End-Key Mobile Application Services.

UNIT II ANDROID APPLICATION **9**

Introduction Android Application -Android version history - Obtaining the Required Tools-Launching Your First Android Application-Exploring the IDE-Debugging Your Application-Publishing Your Application.

UNIT III LINKING ACTIVITIES **9**

Understanding Activities-Linking Activities Using Intents-Fragments-Displaying Notifications- Understanding the Components of a Screen-Adapting to Display Orientation-Managing Changes to Screen Orientation.

UNIT IV USING BASIC VIEWS **9**

Using Basic Views-Using Picker Views -Using List Views to Display Long Lists-Understanding Specialized Fragments - Using Image Views to Display Pictures – Using Menus with Views- Using Web View.

UNIT V CREATING YOUR OWN CONTENT PROVIDERS 9

Sharing Data in Android-Creating Your Own Content Providers -Using the Content Provider- SMS Messaging -Sending Email-Displaying Maps- Getting Location Data-Monitoring a Location.

Total: 45 Hours

COURSE OUTCOMES

On completion of this course, the students can able to,

CO1 To explain the basics of mobile application development
CO2 Develop an Android application with User interface,
CO3 Build an application using Android development environment
CO4 Experiment with the method of storing, sharing and retrieving the data in Android Applications.
CO5 Examine responsive user interface across wide range of devices.
CO6 Create a mobile Application using components like activity, views, services, content providers.

Text book

1. Jerome DiMarzio, "*Beginning Android Programming with Android Studio*", 4thEdition.

Reference book:

1. Dawn Griffiths, David Griffiths, "*Head First Android Development: A Brain-Friendly Guide",* 2017.
2. Neil Smyth , "*Android Studio 3.0 Development Essentials: Android",* 8th Edition.
3. Pradeep Kothari, "*Android Application Development (With Kitkat Support)",* Black Book 2014.

Web Links:

1. https://developer.android.com/guide
2. Develop App for Free
3. https://flutter.dev/
4. http://ai2.appinventor.mit.edu
5. https://aws.amazon.com/mobile/mobile-application-development

24CBIT53 **OPERATING SYSTEM**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES

CO1:To identify the role of Operating System.

CO2:To implement file allocation methods

CO3:To develop solutions for synchronization problems using semaphore

UNIT – I OPERATING SYSTEMS OVERVIEW 12

Operating System Structures: Services, System Calls, Types, Operating System Structure, System Boot. Processes: Process Concept, Scheduling, Operations, Interprocess Communication. Multithreaded Programming: Multicore Programming, Multithreading Models.

UNIT –II PROCESS MANAGEMENT 12

Process Synchronization: The Critical-Section Problem, Mutex Locks, Semaphores, Classic Problems of synchronization. Process Scheduling: Criteria, Scheduling Algorithms. Deadlocks: System model, Characterization, Methods for handling deadlocks, Deadlock Prevention, Avoidance, Detection and Recovery from deadlock.

UNIT – III MEMORY MANAGEMENT 12

Memory Management Strategies: Background, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of the Page Table. Virtual Memory Management: Demand Paging; Copy-on-Write, Page Replacement; Allocation of Frames; Thrashing, Memory-Mapped Files.

UNIT – IV FILE SYSTEM 12

File-System and Directory Implementation, Allocation Methods, Free Space Management, Efficiency and Performance, Recovery. Mass-Storage Structure: Overview, Disk Scheduling, Disk Management. Distributed Systems: Advantages, Types of Network- based OS, Robustness, Design Issues, and Distributed File Systems.

UNIT – V I/O SYSTEM **12**

Mass storage structure - overview of mass storage structure, disk structure, disk attachment, disk scheduling algorithms, swap space management, stable storage implementation, tertiary storage structure. Case Studies: The UNIX System, Windows 10 (Process, Memory, storage management)

Total Hours: 60

COURSE OUTCOMES

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

CO1: Understand the basic concepts and functions of operating systems.
CO2: Understand Processes and Deadlocks
CO3: Analyze Scheduling algorithms
CO4: Compare and contrast various memory management schemes
CO5: Understand I/O management
CO6: Realize the functionality of file systems.
CO7: Compare UNIX OS and Windows OS
CO8: Perform administrative tasks on Unix Servers.

Textbook

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne: Operating Systems Concepts, 9thEdition, 2016 India, Wiley.

Reference Books

1. William Stallings, “Operating Systems-Internals and Design Principles”, Pearson, IX Edition, 2018
2. D M Dhamdhere: Operating Systems – A Concept Based Approach, III Edition, Tata McGraw – Hill, 2015.
3. Harvey M Deitel, Paul J Deitel, Dr Choffnes,“Operating Systems”, Pearson Education Limited (Publisher), 3rd Edition, 2013.
4. J. Archer Harris, John Cordani, “ Operating Systems”, Schaum's Outline, Indian Edition, Mc Graw Hill Education (India), First Editio

5. Gary Nutt, Nabendu Chaki, Sarmistha Neog, “Operating Systems” Pearson Education 3rd Edition, 2016.

Web Links:

1. https://www.tutorialspoint.com/operatingsystem/os_overview.htm
2. https://www.javatpoint.com/operating-system
3. https://profile.iiita.ac.in/bibhas.ghoshal/teaching_os.html
4. https://courses.cs.washington.edu/courses/cse451/16au/readings/ritchie7

24DBIT51 **ARTIFICIAL INTELLIGENCE**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

- Learn the basics of AI approaches
- Develop problem solving agents
- Perform logical and probabilistic reasoning

UNIT I INTELLIGENT AGENTS 12

Introduction to AI – Agents and Environments – concept of rationality – nature of environments – structure of agents. Problem solving agents – search algorithms – uninformed search strategies.

UNIT II PROBLEM SOLVING 12

Heuristic search strategies – heuristic functions. Local search and optimization problems – local search in continuous space – search with non-deterministic actions – search in partially observable environments – online search agents and unknown environments

UNIT III GAME PLAYING AND CSP 12

Game theory – optimal decisions in games – alpha-beta search – monte-carlo tree search – stochastic games – partially observable games. Constraint satisfaction problems – constraint propagation – backtracking search for CSP – local search for CSP – structure of CSP.

UNIT IV LOGICAL REASONING 12

Knowledge-based agents – propositional logic – propositional theorem proving – propositional model checking – agents based on propositional logic. First-order logic – syntax and semantics – knowledge representation and engineering – inferences in first-order logic – forward chaining – backward chaining – resolution.

UNIT V PROBABILISTIC REASONING 12

Acting under uncertainty – Bayesian inference – naïve Bayes models. Probabilistic reasoning – Bayesian networks – exact inference in BN – approximate inference in BN – causal networks.

Total: 60 Hours

COURSE OUTCOMES:

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

CO1. Explain intelligent agent frameworks

CO2. Apply problem solving techniques

CO3. Apply game playing and CSP techniques

CO4. Perform logical reasoning

CO5. Perform probabilistic reasoning under uncertainty

Text Book:

1. Stuart Russell and Peter Norvig, “Artificial Intelligence – A Modern Approach”, Fourth Edition, Pearson Education, 2021.

Reference Books:

1. Dan W. Patterson, “Introduction to AI and ES”, Pearson Education,2007
2. Kevin Night, Elaine Rich, and Nair B., “Artificial Intelligence”, McGraw Hill, 2008
3. Patrick H. Winston, "Artificial Intelligence", Third Edition, Pearson Education, 2006
4. Deepak Khemani, “Artificial Intelligence”, Tata McGraw Hill Education, 2013.

Web Links:

1. https://www.geeksforgeeks.org/artificial-intelligence/?ref=lbp
2. https://www.simplilearn.com/tutorials/artificial-intelligence-tutorial/what-is-artificial-intelligence
3. https://archive.nptel.ac.in/courses/106/102/106102220

24DBIT52 **SOFTWARE PROJECT MANAGEMENT**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES

To identify the insight of software management.

To implement design patterns and their applications.

To develop projects with emerging trends.

UNIT – I PROJECT CONCEPTS AND ITS MANAGEMENT 12

Project life cycle models-ISO 9001 model-Capability Maturity Model-Project Planning-Project tracking-Project closure. Evolution of Software Economics.

UNIT – II SOFTWARE MANAGEMENT PROCESS FRAMEWORK 12

Software Management Process Framework: Phases, Artifacts, Workflows, Checkpoints – Software Management Disciplines: Planning / Project Organization and Responsibilities / Automation / Project Control – Modern Project Profiles

UNIT - III COST ESTIMATION 12

Problems in Software Estimation – Algorithmic Cost Estimation Process, Function Points, SLIM (Software Life cycle Management), COCOMO II (Constructive Cost Model) – Estimating Web Application Development – Concepts of Finance, Activity Based Costing and Economic Value Added (EVA) – Balanced Score Card.

UNIT- IV - SOFTWARE QUALITY MANAGEMENT 12

Software Quality Factors – Software Quality Components – Software Quality Plan – Software Quality Metrics – Software Quality Costs – Software Quality Assurance Standard – Certification – Assessment.

UNIT- V PROJECT EVALUATION AND EMERGING TRENDS 12

Strategic Assessment–Technical Assessment–Cost Benefit Analysis–Cash Flow Forecasting–Cost Benefit Evaluation Technique–Risk Evaluation–Software Effort Estimation. Emerging Trends: Import of the internet on project Management – people Focused Process Models.

Total Hours: 60

COURSE OUTCOMES

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

CO1: To understand Software Project Models and Software Management Concepts.

CO2: To understand the various methods of Cost Estimation.

CO3: To Study about Software Quality Management.

CO4: To understand Project Evaluation.

Textbook

1. Ramesh Gopalaswamy , “Managing and global Software Projects”, Tata McGraw Hill Tenth Reprint, 2011.
2. Roger S.Pressman, “Software Engineering- A Practitioner’s Approach“, 7 th Edition ,McGraw Hill, 2010.

Reference Books

1. Daniel Galin, “Software Quality Assurance: from Theory to Implementation”, Addison-Wesley, 2003. 4. Bob hughes and Mike Cotterell, “Software Project Management” second edition,1999.
2. Royce, W. “Software Project Management: A Unified Framework”, Addison- Wesley, 1998. 6. Demarco, T. and Lister, T. “Peopleware: Productive Projects and Teams, 2 nd Ed.”, Dorset House,1999.
3. Fenton, N.E., and Pfleeger, S.L.. “Software Metrics: A Rigorous and Practical Approach, Revised” Brooks Cole, 1998.
4. Kaplan, R.S., Norton, D.P. “The Balanced Scorecard: Translating Strategy into Action”, Harvard Business School Press, 1996.
5. Boehm, B. W. "Software Risk Management: Principles and Practices" in IEEE Software, January 1991, pp32-41.

Web Links:

1. https://www.geeksforgeeks.org/software-engineering-software-project-management-spm/
2. https://www.javatpoint.com/software-project-management
3. https://www.coursera.org/articles/software-project-management

24PBIT51 **SOFTWARE TESTING LAB**

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

- To make the student apply testing strategy.
- To execute a program with the intent of finding an error.
- To write a good test case is one that has a high probability of finding an as yet undiscovered error.
- To find a successful test is one that uncovers an as yet undiscovered error.

LIST OF PROGRAMS:

1. Write programs in "C"Language to demonstrate the working of the following a. constructs: i) do...while ii) while….do iii) if…else iv) switch v) for loops in C language and design test cases
2. A program written in " C" language for Matrix Multiplication fails Introspect the causes for its failure and write down the possible reasons for its failure.
3. Design test cases for simple calculator application.
4. Write the test cases for any known application (e.g. Banking application)
5. Create a test plan document for any application (e.g. Library Management System)
6. Study of any testing tool (e.g. Win runner)
7. Study of any web testing tool (e.g. Selenium)
8. Take any system (e.g. ATM system) and study its system specifications
   a. and report the various bugs.
9. Design test cases for web pages testing any web sites
10. Study of any open source-testing tool (e.g. Test Link)

Total: 15 Hour

COURSE OUTCOMES:

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

CO1: Design effective test cases that can uncover critical defects in the application.

CO2: Carry out advanced types of testing.

CO3: Automate the software testing using Selenium Testing.

CO4: Generate Test Report

Text Books:

1. Yogesh Singh, “Software Testing”, Cambridge University Press, 2012
2. Unmesh Gundecha, Satya Avasarala, "Selenium WebDriver 3 Practical Guide" – Second Edition 2018

Reference Book:

1. Glenford J. Myers, Corey Sandler, Tom Badgett, The Art of Software Testing, 3rd Edition,2012, John Wiley & Sons, Inc.
2. Ron Patton, Software testing, 2nd Edition, 2006, Sams Publishing.Paul C. Jorgensen, Software Testing:A Craftsman’s Approach, Fourth Edition, 2014, Taylor & Francis Group
3. Carl Cocchiaro, Selenium Framework Design in Data-Driven Testing, 2018, Packt Publishing.
4. Satya Avasarala, Selenium WebDriver Practical Guide, 2014, Packt Publishing. Varun Menon, TestNg Beginner's Guide, 2013, Packt Publishing.
5. Elfriede Dustin, Thom Garrett, Bernie Gaurf, Implementing Automated Software Testing, 2009, Pearson Education, Inc.

Web Links:

1. https://aif.org/wp-content/uploads/2018/10/Software-Testing-Trng-Module-2018a_MAST.pdf
2. https://ix.cs.uoregon.edu/~michal/book/Samples/book.pdf
3. https://www.tutorialspoint.com/software_testing/software_testing_tutorial_in_pdf.htm
4. https://ix.cs.uoregon.edu/~michal/book/Samples/book.pdf

24PBIT52 **MOBILE APPLICATION DEVELOPMENT LAB**

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

- To give overall view of Mobile application development
- Develop and Publish Android applications using Graphical user interface
- Develop and Publish Android application which can use Location and network services

LIST OF PROGRAMS:

1. Develop an application that finds greatest among three numbers using GUI Components
2. Develop an application to display your personal details using GUI Components
3. Develop an application that uses the radio button
4. Develop an application that uses the image button
5. Develop an application that uses Alert Dialog Box
6. Develop an application that uses Layout Managers.
7. Develop an application that uses audio mode (NORMAL, SILENT, VIBRATE)
8. Develop an application that uses to send messages from one mobile to another mobile.
9. Develop an application that uses to send email
10. Develop an application for mobile calls.
11. Develop an application for Student Mark sheet processing
12. Develop an application for Login Page in Database.
13. Develop an application for Google map locator (optional)

Total: 15 Hour

COURSE OUTCOMES

On completion of this course, the students can able to,

CO1 To explain the basics of mobile application development
CO2 Develop an Android application with User interface,
CO3 Build an application using Android development environment
CO4 Use Emulator tools to design and develop applications

Text book

1. Jerome DiMarzio, "*Beginning Android Programming with Android Studio*", 4th Edition.

Reference book:

1. Dawn Griffiths, David Griffiths, "*Head First Android Development:*
   a. *A Brain-Friendly Guide",* 2017.
2. Neil Smyth , "*Android Studio 3.0 Development Essentials: Android",* 8th Edition.
3. Pradeep Kothari, "*Android Application Development (With Kitkat Support)",* Black Book 2014.

Web Links:

- https://developer.android.com/guide
- Develop App for Free
- https://flutter.dev/
- http://ai2.appinventor.mit.edu

24SBIT51 ENTREPRENEURIAL DEVELOPMENT

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

1. To enable the students to understand the concept of Entrepreneurship
2. To learn the professional behavior expected of an entrepreneur.
3. To identify significant changes and trends which create business opportunities
4. To analyze the environment for potential business opportunities.
5. To provide conceptual exposure on converting idea to a successful entrepreneurial firm.
6. To motivate young minds to set up their own venture and contribute to national economic development

UNIT I: ENTREPRENEURSHIP 10

Entrepreneur: Meaning of entrepreneurship – Types of Entrepreneurship – Traits of entrepreneurship – Factors promoting entrepreneurship- Barriers to entrepreneurship- the entrepreneurial culture- Stages in entrepreneurial process – Women entrepreneurship and economic development- SHG.

UNIT II: DEVELOPING SUCCESSFUL BUSINESS IDEAS 10

Recognizing opportunities – trend analysis – generating ideas – Brainstorming, Focus Groups, Surveys, Customer advisory boards, Day in the life research – Encouraging focal point for ideas and creativity at a firm level-Protecting ideas from being lost or stolen – Patents and IPR.

UNIT III: OPPORTUNITY IDENTIFICATION AND BUSINESS PLANNING PROCESS 10

Opportunity identification product/service selection – Generation and screening the project ideas – Market analysis, Technical analysis, Cost benefit analysis and network analysis- Meaning of business plan- Business plan process- Advantages of business planning- preparing a model project report for starting a new venture (Team-based project work).

Total Hours 30

Course Outcomes:

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

CO1: Understand the basic concepts of entrepreneurship

CO2: Gain knowledge about business plans

CO3: Write a business plan.

CO4: Prepare project reports for starting a new ventures on team based..

CO5: Discern distinct entrepreneurial traits.

CO6: Know the parameters to assess opportunities and constraints for new business ideas.

CO7: Design strategies for successful implementation of innovative business ideas.

Text Book:

1. Reddy, Entrepreneurship: Text & Cases - Cengage, New Delhi.
2. Kuratko/rao, Entrepreneurship: a south asian perpective.- Cengage, New Delhi.
3. Leach/Melicher, Entrepreneurial Finance – Cengage. , New Delhi.
4. K.Sundar – Entrepreneurship Development – Vijay Nicole Imprints private Limited
5. Khanka S.S., Entrepreneurial Development, S.Chand & Co. Ltd., New Delhi, 2001.
6. Sangeeta Sharma, Entrepreneurship Development, PHI Learning Pvt. Ltd., 2016.

References:

1. Bessant, J., and Tidd, J., Innovation and Entrepreneurship, 2nd Edition, John Wiley &Sons, 2011.
2. Desai, V., Small Scale Industries and Entrepreneurship, Himalaya Publishing House, 2011.
3. Donald, F.K., Entrepreneurship- Theory, Process and Practice, 9th Edition, Cengage Learning, 2014.
4. Nagendra and Manjunath, V.S., Entrepreneurship and Management, Pearson, 2010.
5. Reddy, N., Entrepreneurship: Text and Cases, Cengage Learning, 2010.
6. Roy, R., Entrepreneurship, 2nd Edition, Oxford University Press, 2011.
7. Stokes, D., and Wilson, N., Small Business Management and entrepreneurship, 6th Edition, Cengage Learning, 2010.
8. Barringer, B., Entrepreneurship: Successfully Launching New Ventures, 3rd Edition, Pearson, 2011.

Web Links:

1. http://inventors.about.com/od/entrepreneur/
2. http://learnthat.com/tag/entrepreneurship/
3. www.managementstudyguide.com
4. www.quintcareers.com
5. www.entrepreneur.com

24DVAC51 **VALUE EDUCATION**

L	T	P	O	C
2	0	0	1	2

COURSE OBJECTIVES:

The course aims to nurture ethical principles, holistic living, and moral values, fostering responsible and balanced individuals. It equips students with essential life skills like decision-making, teamwork, and time management while promoting awareness of human rights and environmental conservation. Additionally, it sensitizes learners to social issues and prepares them to address societal challenges effectively.

Unit I **6**

Value education-its purpose and significance in the present world – Value system – The role of culture and civilization-Holistic living – Balancing the outer and inner – Body, Mind and Intellectual level-Duties and responsibilities.

Unit II **6**

Salient values for life- Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity , and inclusiveness, Self esteem and self confidence, punctuality – Time, task and resource management -Problem solving and decision making skills- Interpersonal and Intra personal relationship – Team work – Positive and creative thinking

Unit III **6**

Human Rights – Universal Declaration of Human Rights – Human Rights violations – National Integration – Peace and non-violence – Dr. A P J Kalam's ten points for englightened citizenship – Social Values and Welfare of the citizen – The role of media in value building.

Unit IV **6**

Environment and Ecological balance – interdependence of all beings – living and non-living. The binding of man and nature – Environment conservation and enrichment.

Unit V **6**

Social Evils – Corruption, Cyber crime, Terrorism – Alcoholism, Drug addiction – Dowry – Domestic violence – untouchability – female infanticide – atrocities against women- How to tackle them

Total: 30 Hours

COURSE OUTCOMES

CO1: Understand the significance of value systems, holistic living, and individual responsibilities to achieve personal and societal balance.

CO2: Develop core values such as integrity, empathy, and time management skills, along with problem-solving and effective decision-making abilities.

CO3: Gain awareness of human rights, social welfare, and the role of media in fostering peace, unity, and enlightened citizenship.

CO4: Comprehend the importance of environmental conservation, ecological balance, and the interconnectedness of all living and non-living beings.

CO5: Identify and analyze social evils like corruption, cybercrime, and domestic violence, and explore strategies to combat these issues.

Text Books:

1. Roger Packham, Margaret Taplin, Kevin Francis - How Values Education Can Improve Student and Teacher Wellbeing - 2024

2. Various Authors - Value-Creating Education: Teachers' Perceptions and Practice - 2021

Reference Books:

1. Nucci, Larry, and Ilten-Gee, Robyn. Moral Education for Social Justice. 2021

2. John Chi-Kin Lee, *Spiritual, Life and Values Education for Children*, 2023

24IBIT51 **INTERNSHIP-II**

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

The internship aims to:

1. Provide hands-on experience with software development, programming, and problem-solving.
2. Expose participants to real-world IT workflows, software life cycles, and project management.
3. Enhance understanding of core computer science domains such as data structures, algorithms, and system design.
4. Develop skills in emerging technologies like cloud computing, machine learning, and cybersecurity.
5. Build teamwork, communication, and technical documentation abilities.

COURSE MODULES

Module 1: Introduction to Software Development

- Overview of SDLC
- Tools for Software Development (e.g., Git, JIRA, IDEs)
- Agile and Scrum Methodologies

Module 2: Programming Fundamentals and Development

- Review of Core Programming Languages (C++, Java, Python, etc.)
- Hands-on: Developing Algorithms and Solving Problems
- Working with APIs and Libraries

Module 3: Web and Mobile Application Development

- Basics of Web Technologies (HTML, CSS, JavaScript)
- Backend Development (Node.js, Django, or Flask)
- Mobile App Development (Flutter or React Native)
- Hands-on: Developing a Full-Stack Application

Module 4: Data Structures and Algorithms

- Problem Solving with Data Structures (Arrays, Trees, Graphs, etc.)
- Algorithmic Techniques (Sorting, Searching, Dynamic Programming)
- Competitive Programming Exercises

Module 5: Database Design and Management

- Relational Databases (SQL) and NoSQL Databases (MongoDB)
- Database Modeling and Normalization
- Hands-on: Building and Querying Databases

Module 6: Emerging Technologies

- Basics of Cloud Computing (Azure, AWS, or Google Cloud)
- Introduction to Machine Learning and AI
- Cybersecurity Essentials
- Hands-on: Implementing Cloud or ML Features in a Project

Module 7: Final Project

- Selection of a Domain-Specific Problem (E.g., E-Commerce, IoT Integration)
- Team Collaboration and Milestone Planning
- Project Development, Testing, and Deployment
- Final Presentation and Documentation

Total: 15 Hours

COURSE OUTCOMES:

Upon completion of this internship, participants will be able to:

CO1:Apply computer science concepts to real-world problems effectively.

CO2: Develop, test, and deploy software applications.

CO3: Demonstrate proficiency in programming languages and frameworks used in the internship.

CO4: Understand and contribute to software development lifecycle (SDLC) processes.

CO5: Work collaboratively on team projects, using agile or other methodologies.

CO6: Present technical findings and document project outcomes effectively.

SEMESTER VI

24CBIT61 **R- PROGRAMMING**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES

- To understand the basic concepts of R , Controls statements , functions and arrays
- To analyze various data structures and their functions
- To gain the knowledge of R Functions, Packages and Files

UNIT – I INTRODCTION *9*

Introduction to R: Overview of R programming, Evolution of R- History of R- Programming –Features of R-Programming-Comparison between R and Python-Applications of R program

UNIT – II OPERATORS DATA TYPES *9*

Basic Concepts of R: Reserved Words, Variables & Constants Operators, Operator Precedence, Data Types , Input,Output features in R- Programming..

UNIT – III CONTROL STRUCTUES *9*

Data structures in R: Vectors, Matrix, List in R programming Data Frame, Factor . Control flow: If else, If else() Function, Programming for loop While Loop, Break & next, Repeat Loop

UNIT – IV FUNCTIONS *9*

Functions: R Functions, Built-in-Functons-User-defined-Functiona-single input single output-Multiple input and Multiple output-Inline function-Function Return Value, Environment & Scope, R Recursive Function, R Infix Operator, R Switch Function. Strings: String construction rules, String Manipulation functions

UNIT – V PACKAGES 9

R packages: Study of different packages in R - R Data Reshaping: Joining Columns and Rows in a Data Frame Merging Data Frames, Melting and Casting - Working with files: Read and writing into different types of files

Total Hours: 45

COURSE OUTCOME:

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

CO1: Develop joining of columns and rows in a data frame and merging data frames.

CO2: Examine and analyze the importance of R Functions, Packages and Files

CO3: Use R Functions, Packages and Files

CO4: Describe the fundamental concepts and applications of R Language

CO5: Define the basic concepts of R language

TEXT BOOKS:

1. The Art of R Programming-a tour of statistical software design by Norman Matloff

2. R Cookbook: Proven Recipes for Data Analysis, Statistics, and Graphics (O'Reilly Cookbooks) by Paul Teetor

3. R in Action Book by Rob Kabacoff, John Mount , Jim Porzak

REFERENCE BOOKS:

1. Hadley Wickham, Garrett Grolemund, " R for data science : Import, Tidy, Transform, Visualize, And Model Data".
2. Richard Cotton "Learning R: A Step-by-Step Function Guide to Data Analysis"

WEB LINKS:

1. https://www.tutorialspoint.com/r/r_tutorial.pdf
2. https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf
3. https://www.stats.ox.ac.uk/~evans/Rprog/LectureNotes.pdf
4. https://www.guru99.com/r-programming-tutorial-pdf.html

24CBIT62 **MACHINE LEARNING**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

To introduce students to the basic concepts and techniques of Machine Learning.

To have a thorough understanding of the Supervised and Unsupervised learning techniques

To study the various probability based learning techniques

To understand graphical models of machine learning algorithms

UNIT 1 INTRODUCTION 12

Designing a learning system - Perspectives and Issues in machine learning - Concept learning task- Concept learning as search - Version spaces - Candidate Elimination learning algorithm - Inductive Bias

UNIT 2 DECISION TREE LEARNING 12

Decision Tree representation - Appropriate Problems for Decision Tree Learning - Basic Decision tree learning algorithm - Hypothesis space search and Inductive Bias in Decision tree learning - Issues in Decision Tree Learning. ANN: Perceptron's - Back Propagation Algorithms.

UNIT 3 BAYESIAN LEARNING 12

Bayes Theorem and Concept learning - Maximum Likelihood and Least Squared error hypothesis- Maximum Likelihood hypotheses for predicting probabilities - Minimum Description Length principle - Bayes optimal classifier - Gibbs algorithm - Naïve Bayes classifier - Bayesian Belief networks -EM algorithm.

UNIT-4 ANALYTICAL AND COMBINING INDUCTIVE LEARNING 12

Analytical learning - Explanation based learning - Inductive Analytical approaches to learning - Using prior knowledge to initialize the hypothesis, to alter the search objective and to augment search operators.

UNIT 5INSTANCE-BASED LEARNING AND REINFORCEMENT LEARNING 12

K - nearest neighbor learning -Locally weighted regression - Radial Basis functions - Case based reasoning - Reinforcement learning: Learning Task-Q Learning; Q function - Algorithm for learning Q-convergence - Updating sequence - Temporal difference learning.

Total No of Hours 60

COURSE OUTCOME

Students will be able to:

CO1: Classify existing machine learning algorithms.

CO2: Use systems that uses the appropriate graph models of machine learning.

CO3: Apply the appropriate machine learning strategy for any given problem.

CO4: Explain supervised, unsupervised or semi-supervised learning algorithms for any given problem.

CO5: Define supervised, unsupervised and semi-supervised learning.

TEXT BOOK

1. Tom M Mitchell, "Machine Learning", McGraw Hill, 1st Edition, 2003.

REFERENCE BOOKS

1. EthemAlpaydin, "Introduction to Machine Learning", MIT Press, 2nd Edition, 2010.
2. Stephan Marsland, "Machine Learning - An Algorithmic Perspective", Chapman and Hall, 1st Edition, 2009.
3. Nils Nilsson, "Introduction to Machine Learning", MIT Press, 1997.
4. Jude Shavil, Thomas G Dietterich, "Readings in Machine Learning", Morgan Kaufmann Publishers, 1990.8. Peter Harrington, “Machine Learning in Action”, DreamTech

WEB SITES

1. Www.w3schools.com
2. Www.tutorialspoint.com
3. https://en.wikipedia.org
4. Www.geeksforgeeks.org
5. www.investopedia.com
6. www.guru99.com

WEB SOURCES

1. https://ai.stanford.edu/~nilsson/MLBOOK.pdf
2. https://alex.smola.org/drafts/thebook.pdf
3. https://courses.edx.org/asset

24CBIT63 **PRINCIPLES OF DATA SCIENCE**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

It is designed to provide students with a solid grounding in essential concepts and skills necessary for understanding and applying data science principles. Students will be introduced to the fundamentals of data collection, cleaning, and exploration, gaining proficiency in techniques for preparing data for analysis.

UNIT I : INTRODUCTION 12

Data Science: Benefits and uses – facets of data – Data Science Process: Overview – Defining research goals – Retrieving data – Data preparation – Exploratory Data analysis – build the model– presenting findings and building applications – Data Mining – Data Warehousing – Basic Statistical descriptions of Data

UNIT II: DESCRIBING DATA 12

Types of Data – Types of Variables -Describing Data with Tables and Graphs –Describing Data with Averages – Describing Variability – Normal Distributions and Standard (z) Scores

UNIT III : DESCRIBING RELATIONSHIPS 12

Correlation –Scatter plots –correlation coefficient for quantitative data –computational formula for correlation coefficient – Regression –regression line –least squares regression line – Standard error of estimate – interpretation of r2 –multiple regression equations –regression towards the mean

UNIT IV: PYTHON LIBRARIES FOR DATA WRANGLING 12

Basics of Numpy arrays –aggregations –computations on arrays –comparisons, masks, boolean logic – fancy indexing – structured arrays – Data manipulation with Pandas – data indexing and selection – operating on data – missing data – Hierarchical indexing – combining datasets – aggregation and grouping – pivot tables

UNIT V : DATA VISUALIZATION 12

Importing Matplotlib – Line plots – Scatter plots – visualizing errors – density and contour plots – Histograms – legends – colors – subplots – text and annotation – customization – three dimensional plotting – Geographic Data with Basemap – Visualization with Seaborn.

TOTAL: 60 hours

COURSE OUTCOMES:

CO1: Understanding the data science process, data mining, and basic statistical concepts for effective data analysis.

CO2: Gaining skills to describe data using tables, graphs, averages, and variability measures.

CO3: Analyzing relationships through correlation, regression, and interpreting statistical models.

CO4: Mastering Python libraries (NumPy and Pandas) for efficient data manipulation and wrangling.

CO5: Developing proficiency in data visualization techniques using Matplotlib, Seaborn, and geographic data plotting.

Text Books:

1. "Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python" (2020) – Peter Bruce, Andrew Bruce, and Peter Gedeck.

2. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow by Aurélien Géron (2022)

Reference Books:

1. Simon Haykin, “Neural Networks: A Comprehensive Foundation”, 2ed., Addison Wesley Longman (Singapore) Private Limited, Delhi,2001.

2. "Data Science from Scratch" (2020) – Joel Grus.

Web links

1. https://www.geeksforgeeks.org/what-is-data-science/
2. https://en.wikipedia.org/wiki/Data_science

WEB SOURCES

http://xml.coverpages.org/OWASPTopTen.pdf https://

24CBIT64 **DATA MINING**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES

- To introduce students to the basic concepts and techniques of Data Mining.
- To develop skills of using recent data mining software for solving practical problems.
- To gain experience of doing independent study and research.

UNIT -1 INTRODUCTION TO DATA MINING 12

What is data mining? -Related technologies - Machine Learning, DBMS, OLAP, Statistics -Data Mining Goals - Stages of the Data Mining Process -Data Mining Techniques -Knowledge Representation Methods - Applications

UNIT -2 DATA WAREHOUSE AND OLAP, DATA PREPROCESSING 12

Multidimensional data model -OLAP operations -Data cleaning -Data transformation -Data reduction - Discretization and generating concept hierarchies Data mining knowledge representation -Task relevant data - Background knowledge -Representing input data and output knowledge -Visualization techniques

UNIT -3 DATA MINING ALGORITHMS: ASSOCIATION RULES, CLASSIFICATION 12

Motivation and terminology -Basic idea: item sets -Generating item sets and rules efficiently - Correlation analysis -Basic learning/mining tasks -Inferring rudimentary rules: 1R algorithm -Decision trees -The prediction task -Statistical (Bayesian) classification -Bayesian networks -Instance-based methods (nearest neighbor) -Linear models

UNIT -4 MINING REAL DATA, CLUSTERING 12

Preprocessing data from a real medical domain (310 patients with Hepatitis C). -Applying various data mining techniques to create a comprehensive and accurate model of the data. -Basic issues in clustering - First conceptual clustering system: Cluster/2 -Partitioning methods: k-means, expectation maximization (EM) -Hierarchical methods: distance-based agglomerative and divisible clustering -Conceptual clustering: Cobweb

UNIT -5 ADVANCED TECHNIQUES, DATA MINING SOFTWARE AND APPLICATIONS 12

Text mining: extracting attributes (keywords), structural approaches (parsing, soft parsing). -Bayesian approach to classifying text -Web mining: classifying web pages, extracting knowledge from the web -Data Mining - software and applications'

Total : 60 HOURS

COURSE OUTCOME

At the end of this course, student should be able to

CO1: Sketch the basic concepts of Data Mining.

CO2: Interpret the issues in data preprocessing.

CO3: Understand the data mining Algorithms.

CO4: Understanding concept of mining real data.

CO5: Define concepts of advanced techniques in data mining.

TEXT BOOKS

1. Jiawei Han and MichelineKamber, "Data Mining Concepts and Techniques", ThirdEdition, Elsevier, 2012.
2. Ian H. Witten and Eibe Frank, *Data Mining: Practical Machine Learning Tools and Techniques (Second Edition)*, Morgan Kaufmann, 2005, ISBN: 0-12-088407-0

WEBSITES

1. **www.w3schools.com**
2. **www.tutorialspoint.com**
3. **www.geeksforgeeks.org**

WEB SOURCES

1. https://lecturenotes.in/subject/32/data-mining-and-data-warehousing-dmdw/note
2. https://www.smartzworld.com/notes/data-warehousing-and-data-mining-pdf-notes-dwdm/

24DBIT61 BLOCK CHAIN TECHNOLOGY

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVE:

- This course covers the technical aspects of public distributed ledgers, block chain systems, crypto currencies, and smart contracts.
- Students will learn how these systems are built, how to interact with them, how to design and build secure distributed applications.

UNIT-I BLOCKCHAIN BASICS 12

Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete. Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof positions.

UNIT-II INTRODUCTIONTOBLOCKCHAIN 12

Introduction, Advantage over conventional distributed database, Block chain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, ChainPolicy, Life of Block chain application, Soft & Hard Fork, Private and Public block chain.

UNIT-III DISTRIBUTED CONSENSUSANDCRYPTOCURRENCY 12

Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate. History, Distributed Ledger, Bit coin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Name coin.

UNIT-IV CRYPTOCURRENCYREGULATION **12**

Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Block chain.

UNIT V CASE STUDYONBLOCKCHAIN **12**

Case study on Naive Block chain construction, Memory Hard algorithm – Hash cash implementation, Direct Acyclic Graph, Play with Go-ethereum, Smart Contract Construction, Toy application using Block chain, Mining puzzles

Total No of Hours 60

COURSE OUTCOMES:

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

CO-1: Evaluate a method for solving a problem case study with different perspective **CO-2:** Analyze limitations and proofs are another essential part of block chain technologies, which are learned for betterment of creating block chain.

CO-3: Apply latest crypto currency aspects leads students to understand some of basic concepts of Black Market and Global Economy

CO-4: Understand block chain technologies basics

CO-5: Describing the history behind the block chain and learning about Vulnerability, Attacks and Side chain gives an additional support for creating a secured block chain.

TEXT BOOK:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19,2016).

REFERENCE BOOKS:

1. Draft version of "S. Shukla, M. Dhawan, S. Sharma, S. Venkatesan, 'Blockchain Technology: Crypto currency and Applications', Oxford University Press,2019.

2. Josh Thompson, 'Block chain: The Block chain for Beginnings, Guild to Block chainTechnology and Block chain Programming', Create Space Independent Publishing Platform,2017.

WEB SOURCES:

1. https://www.blockchainexpert.uk/book/blockchain-book.pdf
2. https://users.cs.fiu.edu/~prabakar/cen5079/Common/textbooks/Mastering_Blockchain 2nd Edition. pdf
3. https://www.gsb.stanford.edu/sites/gsb/files/publication-pdf/study-blockchain-impact-moving- beyond-hype_0.pdf

24DBIT62 CRYPTOGRAPHY AND ITS APPLICATION

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

To understand the fundamentals of Cryptography, acquire knowledge on standard algorithms used to provide confidentiality, integrity and authenticity. To understand the various key distribution and management schemes and to explore how to deploy encryption techniques to secure data in transit across data networks.

UNIT I :INTRODUCTION & NUMBER THEORY 12

Services, Mechanisms and attacks-the OSI security architecture-Network security model-Finite Fields and Number Theory: Groups, Rings, Fields-Modular arithmetic-Euclid's algorithm - Finite fields - Polynomial Arithmetic – Prime numbers - Fermat's and Euler's theorem -Testing for primality –The Chinese remainder theorem- Discrete logarithms.

UNIT II : BLOCK CIPHERS & PUBLICKEY CRYPTOGRAPHY 12

Data Encryption Standard-Block cipher principles-block cipher modes of operation-Advanced Encryption Standard (AES)-Triple DES-Blowfish-RC5 algorithm. Public key cryptography: Principles of public key cryptosystems-The RSA algorithm-Key management - Diffie Hellman Key exchange-Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT III : HASH FUNCTIONS AND DIGITAL SIGNATURES 12

Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC –MD5 - SHA - HMAC – CMAC - Digital signature &authentication Protocols.

UNIT IV :SECURITY PRACTICE & SYSTEMSECURITY 12

Authentication applications – Kerberos – X.509 Authentication services - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls design principles –Trusted systems.

UNIT IV : E-MAIL, IP &WEBSECURITY 12

E-mail Security: Security Services for E-mail-attacks possible through E-mail - establishing keys privacy - authentication of the source - Message Integrity - Non-repudiation - Pretty Good Privacy - S/MIME. IPSecurity: Overview of IPSec - IP and IPv6 - Authentication Header - Encapsulation Security Payload (ESP) - Web Security: SSL/TLS Basic Protocol-computing the keys - Encoding-

Secure Electronic Transaction (SET).

Total: 60 Hours

COURSE OUTCOMES:

CO-1: Identify computer and network security threats, classify the threats and develop a Security model to prevent, detect and recover from the attacks.

CO-2: Knowledge and understanding of Basics of number theory, Key management, Public key cryptosystems, Message authentication, Hash functions and algorithms.

CO-3: Will develop their skills in the programming of symmetric and/or asymmetric ciphers and their use in the networks.·

CO-4: Develop SSL or Firewall based solutions against security threats, employ access Control techniques to the existing computer platforms such as Unix and Windows NT.

CO-5: Identify E-mail-attacks and establishing keys privacy E-Mail attacks.

Text Books:

1. Marcelo Sampaio de Alencar, , Cryptography and Network Security,2022
2. Behrouz A.Forouzan, Debdeep Mukhopadhyay, "Cryptography and Network Security", Tata McGraw Hill Second Edition,2010.

Reference Books:

1. Bernard Menezes, "Network Security and Cryptography", Cengage Learning, India Edition,2017.

Web links

1. ***https://www.geeksforgeeks.org/cryptography-and-its-types/***
2. ***https://www.javatpoint.com/cryptography-definition***

24PBIT61 **R - PROGRAMMING LAB**

L	T	P	O	C
0	0	2	1	1

COURSE OBJECTIVES:

Handling the data using R tool.

LAB ASSIGNMENTS:

1. Assignments on Basic Concepts of R
2. Assignments on Data structures in R
3. Assignments on Control flow
4. Assignments on Functions
5. Assignments on R packages, R Data Reshaping
6. Assignments on Working with files, R object and Class
7. Assignments on Data visualization in R and Data Management

COURSE OUTCOME:

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

CO1: Get a solid foundation in R programming concepts

CO2: Collect, analyze and interpret quantitative data

CO3: Create and edit visualizations with R

CO4: Access online resources for R and import new function packages into the R workspace

CO5: Import, review, manipulate and summarize data-sets in R

TEXTBOOKS:

1. The Art of R Programming-a tour of statistical software design by Norman Matloff
2. R Cookbook: Proven Recipes for Data Analysis, Statistics, and Graphics (O'Reilly Cookbooks) by Paul Teetor
3. R in Action Book by Rob Kabacoff, John Mount , Jim Porzak

REFERENCE BOOKS:

3. Hadley Wickham, Garrett Grolemund, " R for data science : Import, Tidy, Transform, Visualize, And Model Data".
4. Richard Cotton "Learning R: A Step-by-Step Function Guide to Data Analysis"

WEBSITES:

1. https://www.tutorialspoint.com/r/index.htm
2. https://www.guru99.com/r-programming-introduction-basics.html
3. https://www.datacamp.com/tracks/r-programming

WEB SOURCES:

5. https://www.tutorialspoint.com/r/r_tutorial.pdf
6. https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf
7. https://www.stats.ox.ac.uk/~evans/Rprog/LectureNotes.pdf
8. https://www.guru99.com/r-programming-tutorial-pdf.html

24SBIT61 **MINI PROJECT**

L	T	P	O	C
2	0	0	2	2

COURSE OBJECTIVES:

The objective of the mini project is to help the student develop the ability to apply theoretical and practical tools / techniques to solve real life problems related to industry academic institutions.

Students are to take up sample project development activities with the guidelines given below:

1. Preparing a project - brief proposal including:
   - Problem Identification
   - Developing a model for solving the problem

   A statement of system / process specifications proposed to be developed (Data
   - FlowDiagram)
   - List of possible solutions including alternatives and constraints
   - Cost benefit analysis
   - Time line activities
2. A report highlighting the design finalization [based on functional requirements & standards(if any)]
3. A presentation including the following:
   - Implementation phase (Hardware / Software / both)
   - Testing & Validation of the developed system
   - Learning in the Project Consolidated report preparation.

Total: 30 Hours

COURSE OUTCOMES:

At the End of this Course, the Student will be able to:

CO-1: Create new project with Report:

CO-2: Evaluate project scope and Objectives.

CO-3: Analyze Software, Hardware and tools needed for the Project.

CO-4: Apply technical knowledge to solve project problem.

CO-5: Understand the implementation of Project

SEMESTER VII

24CBIT71 **Fundamentals of DevOps**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

1. To understand the fundamental principles of DevOps and its role in modern software development.
2. To gain practical knowledge of Continuous Integration (CI), Continuous Delivery (CD), and automation tools.
3. To explore containerization, orchestration, and infrastructure as code.
4. To assess the impact of DevOps practices on team collaboration and software lifecycle.
5. To examine security considerations and best practices in DevOps environments.

UNIT I: INTRODUCTION TO DEVOPS 9

Introduction to DevOps-Evolution and principles of DevOps-DevOps culture and mindset-Benefits of DevOps over traditional methods-Key concepts: Continuous Integration, Continuous Delivery, and Continuous Deployment.

UNIT II:

CONTINUOUS INTEGRATION AND CONTINUOUS DELIVERY CI/CD) 9

CI/CD pipeline basics-Tools for CI/CD (Jenkins, GitLab CI/CD, CircleCI)-Automating builds and testing-Version control systems and repository management (Git)

UNIT III: CONTAINERIZATION AND ORCHESTRATION 9

Introduction to Docker and containerization - Building and managing Docker images-Kubernetes fundamentals for orchestration - Microservices architecture and container networking

UNIT IV: INFRASTRUCTURE AS CODE (IAC) 9

Infrastructure automation concepts-IaC tools: Terraform, Ansible, and AWS CloudFormation-Versioning and automating infrastructure setup-Environment management and scaling infrastructure

UNIT V: DEVOPS SECURITY AND MONITORING 9

Security practices in DevOps (DevSecOps)-Application and network security in DevOps-Monitoring tools and logging (Prometheus, Grafana, ELK Stack)-Incident management and alerting.

TOTAL: 45 HOURS

TEXT BOOKS:

1. **Kim, G., Humble, J., Debois, P., & Willis, J.** The DevOps Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations. **IT Revolution Press.**
2. **Ernest, A.** DevOps for Dummies. **Wiley Publishing.**

Reference Books:

1. Turnbull, J. **The Docker Book: Containerization is the New Virtualization.**
2. Burns, B., Beda, J., & Hightower, K. **Kubernetes Up & Running: Dive into the Future of Infrastructure.** O'Reilly Media.

24CBIT72 **CLOUD COMPUTING**

L	T	P	O	C
4	0	0	2	4

Course Objectives:

To understand the fundamental concepts and principles of cloud computing

To learn about the different types of cloud computing services (IaaS, PaaS, SaaS)

To understand the benefits and challenges of cloud computing

To learn Taxonomy of Virtualization Techniques.

To learn about cloud computing security and compliance

To gain hands-on experience with cloud computing platforms and tools.

UNIT I Introduction to Cloud Computing 12

Evolution and History of Cloud Computing, Introduction to Cloud Computing, Why Cloud Computing is Becoming Highly Important, Features of Cloud Computing, Cloud Computing for various users, Advantages of Cloud Computing, Limitations of Cloud Computing.

UNIT II Cloud Models and Types: 12

The NIST Model, Cloud Cube Model, Deployment Models, Service Models. Layers and Types of Cloud, Components of Cloud Computing, Cloud Computing Service Providers Software as a Service (SaaS): Software as a Service , Evolution of SaaS ,Brief Introductory part of Software as a Service , SaaS Unification Technologies , SaaS Integration Products and Technologies, SaaS Product Selection Criteria, SaaS Integration Services, Advantages of SaaS.

UNIT- III Platform as a Service (PaaS) 12

Introduction to PaaS, Evolution of PaaS, PaaS Service Providers- Acquia Cloud, Amazon AWS, Amazon Elastic Beanstalk, Google App Engine, Force.com, PaaS Application Framework, PaaS Operator Verbs, PaaS Developer Verbs, Advantages and Challenges of PaaS.

UNIT-IV Infrastructure as a Service (IaaS) 12

Evolution, IaaS Architecture- Advantages and Disadvantages of Infrastructure as a Service, SAN model, IaaS Providers, IaaS Architecture, Advantages and Disadvantages of Infrastructure as a Service .

UNIT-V 12

Virtualization: Introduction to Virtualization and its Technical Evolution, History of Virtualization, Types of Virtual Machines, Advantages of Virtualization, Components of Virtualization, Types of Virtualization.

Text Books:

1. Handbook of Cloud Computing By Dr.Anand Nayyar (Editor), First Edition 2019, BPB Publication, India

2. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter TATA McGraw- Hill , New Delhi – 2010

Reference Book

1. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008

2. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier. 3. Cloud Computing, A Hands on approach, ArshadeepBahga, Vijay Madisetti, University Press.

Course Outcomes

1. Compare the strengths and limitations of cloud computing
2. Identify the architecture, infrastructure and delivery models of cloud computin
3. Apply suitable virtualization concept.
4. Choose the appropriate cloud player, Programming Models and approach.
5. Address the core issues of cloud computing such as security, privacy and interoperability.

24CBIT73 **INTERNET OF THINGS**

L	T	P	O	C
4	0	0	2	4

Course Objectives:

1. To understand the foundational concepts of IoT, its architecture, and various components.
2. To explore different IoT communication protocols and data management strategies.
3. To gain insights into IoT hardware platforms and sensors.
4. To develop skills in programming and configuring IoT devices.
5. To analyze real-world applications of IoT across industries and the associated security concerns.

Unit 1: Introduction to IoT 12

Overview of IoT and its evolution-IoT architecture and components: sensors, actuators, processors, and cloud services-IoT protocols and communication models-Applications and impact of IoT across various industries

Unit 2: IoT Communication Protocols and Networking 12

IoT communication models: M2M (Machine-to-Machine) and D2D (Device-to-Device)-IoT protocols: MQTT, CoAP, HTTP, and WebSockets-Networking technologies for IoT: Bluetooth, Zigbee, LoRa, NB-IoT, and cellular networks-Data transmission and management in IoT

Unit 3: IoT Hardware and Sensors 12

IoT hardware platforms: Arduino, Raspberry Pi, and ESP8266/ESP32-Sensors and actuators: types, functionalities, and interfacing with IoT devices-Power management in IoT devices-Sensor data acquisition and pre-processing

Unit 4: Programming and Cloud Integration for IoT 12

IoT programming basics: Python, Node.js, and C++-Cloud services for IoT: AWS IoT, Azure IoT Hub, and Google IoT Core-IoT data storage and analysis in the cloud-Real-time data visualization and remote monitoring

Unit 5: IoT Applications, Security, and Privacy 12

Case studies of IoT applications: smart home, hea^{1}lt^{5}h^{3}care, industrial IoT, and smart cities

IoT security challenges: device authentication, data encryption, and secure communication

Privacy concerns in IoT and best practices-Future trends in IoT

TOTAL:60 HRS

Textbooks:

1. Bahga, A., & Madisetti, V. **Internet of Things: A Hands-On Approach.** VPT.
2. Raj, P., & Raman, A. C. **The Internet of Things: Enabling Technologies, Platforms, and Use Cases.** CRC Press.

Reference Books:

1. McEwen, A., & Cassimally, H. **Designing the Internet of Things.** Wiley.
2. Minerva, R., Biru, A., & Rotondi, D. **Towards a Definition of the Internet of Things (IoT).** IEEE.

Course Outcomes:

After completing this course, students will be able to:

1. Describe the IoT architecture, its components, and functions.
2. Use various communication protocols and standards in IoT.
3. Program and configure IoT devices for data collection and processing.
4. Develop IoT solutions using sensors, hardware, and software platforms.
5. Evaluate IoT applications, considering security and privacy implications.

24DBIT71 UI/UX DESIGN FUNDAMENTALS AND APPLICATIONS

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES

The course aims to provide students with a comprehensive understanding of UI/UX design, focusing on the key differences between User Interface and User Experience. Students will learn essential design principles, user-centered design methodologies, and tools for creating effective and accessible interfaces. The course will also cover advanced topics such as usability testing, interaction design, and current trends in UI/UX, preparing students for practical application in modern software development and emerging technologies.

Unit 1: Introduction to UI/UX Design 12

Overview of UI/UX - Understanding the difference between User Interface (UI) and User Experience (UX) design - Importance of UI/UX in Software Development - How good UI/UX impacts user satisfaction, engagement, and product success - Design Principles - Introduction to principles like clarity, consistency, simplicity, accessibility, and visual hierarchy - User-Centered Design (UCD) - Understanding the concept of designing with the user in mind - Ethics in UI/UX Design - Ethical considerations in user interface design (privacy, data security, inclusivity).

Unit 2: UI Design Principles 12

Visual Design Basics - Typography, color theory, iconography, and layout design - Wireframing and Prototyping - Creating basic wireframes, mockups, and interactive prototypes - UI Design Tools - Introduction to tools like Figma, Adobe XD, Sketch, and InVision - Responsive and Adaptive Design - Techniques for designing interfaces that work on various screen sizes (desktop, tablet, mobile) - Design Systems and Style Guides - Importance of consistency across platforms and the role of style guides.

Unit 3: UX Research and User Testing 12

User Research Methods - Conducting interviews, surveys, and observations to gather user needs - Personas and User Stories - Developing personas and creating user stories to define user needs - Usability Testing - Methods of testing user interfaces with real users, interpreting results, and iterating designs based on feedback - Heuristic Evaluation - Conducting expert reviews based on established heuristics to identify usability issues - A/B Testing and Analytics - Analyzing and comparing variations of design to optimize for user behavior.

Unit 4: Interaction Design and Information Architecture 12

Principles of Interaction Design - Understanding how users interact with interfaces and how to design for effective communication - Information Architecture (IA) - Structuring and organizing content in a

way that is intuitive and logical for users - Navigation Design - Designing clear and user-friendly navigation systems (menus, buttons, links) - Microinteractions - Designing small, subtle interactions to enhance user experience (e.g., button hover states, loading animations) - Accessibility in UI/UX Design - Ensuring that interfaces are usable by people with disabilities (WCAG guidelines, screen readers).

Unit 5: UI/UX in Modern Development **12**

Agile UI/UX Design - Integrating UI/UX processes into Agile development methodologies - Design Handoff to Development - Best practices for delivering design assets and specifications to developers - UI/UX in Mobile Applications - Best practices and differences in UI/UX design for mobile apps (iOS and Android) - Design for Emerging Technologies - UI/UX design considerations for VR/AR, AI, and IoT applications - Current Trends in UI/UX Design - Exploring current trends such as dark mode, neumorphism, voice UI, and conversational UI.

COURSE OUTCOMES

CO1: Students will understand the key concepts of UI/UX, design principles, and the impact of UI/UX on software development and user satisfaction.

CO2: Students will gain proficiency in visual design basics, wireframing, prototyping, and using UI design tools for responsive and adaptive design.

CO3: Students will learn how to conduct user research, create personas, and implement usability testing to improve user interfaces.

CO4: Students will develop skills in interaction design, information architecture, and accessibility to create intuitive, user-friendly interfaces.

CO5: Students will explore UI/UX practices in agile development, mobile applications, and emerging technologies like VR/AR, AI, and IoT.

Text Books:

1. Steve Krug, *Don't Make Me Think: A Common Sense Approach to Web Usability* (2023)

2. Don Norman, *The Design of Everyday Things* (2022)

3. Jesse James Garrett, *The Elements of User Experience: User-Centered Design for the Web* (2022)

Reference Books

1. Jeff Gothelf, *Lean UX: Applying Lean Principles to Improve User Experience* (2023)

2. Alan Cooper, *About Face: The Essentials of Interaction Design* (2022)

Web Links:

1.https://www.coursera.org/specializations/ui-ux-design

24DBIT72 **BIG DATA ANALYTICS**

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

To explore, design, and implement basic concepts of big data & analytics methodologies for analyzing structured and unstructured data with emphasis on the relationship between the Data Scientist and its application to the business needs.

UNIT I INTRODUCTION TO BIG DATA 9

Introduction to Big Data Platform – Challenges of Conventional Systems - Nature of Data- Evolution Of Analytic Scalability - Intelligent data analysis - Analytic Processes and Tools - Analysis vs reporting – Modern Data Analytic Tools

UNIT II MINING DATA STREAMS 9

Introduction to Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream - Real time Analytics Platform (RTAP) Applications

UNIT III ADVANCED ANALYTICS 9

Analyzing, Visualization and Exploring the Data, Statistics for Model Building and Evaluation, Advanced Analytics - K-means clustering, Association rules - Speedup, Linear Regression, Logistic Regression, Naïve Bayes, Decision Trees, Time Series Analysis, Text Analysis

UNIT IV HADOOP 9

History of Hadoop - The Hadoop Distributed File System - Components of Hadoop - Analyzing the Data with Hadoop - Scaling Out- Hadoop Streaming

UNIT V FRAMEWORKS 9

Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications - Real Time Sentiment Analysis, Stock Market Predictions.

Total: 45 Hours

COURSE OUTCOMES:

CO-1: Understand the fundamental concepts of big data platform and know about the basic concepts of nature and evolution of big data.

CO-2: To work with big data platform learn intelligent data analysis and compare old and modern data analytic tool.

CO-3: To understand the k means, naïve, decision tree, time series and text analysis.

CO-4: Learn the fundamental concepts like history and components of Hadoop.

CO-5: Understand the framework of Visual data analysis techniques, interaction techniques.

Text Books:

1. Brad Dayley, "NoSQL with MongoDB in 24 Hours", 1st edition, Sams Publishing, 2024

2. Prajapati, Big Data Analytics with R and Hadoop, 2014

3. Stephan Kudyba, Big Data, Mining, and Analytics: Components of Strategic Decision Making,Auerbach Publications, March 12, 2014.

Reference Books:

1. Nathan Marz, James Warren."Big Data: Principles and Best Practices of Scalable Real-Time Data Systems" (2015)

2. Jure Leskovec, Anand Rajaraman, Jeff Ullman**,**"Mining of Massive Datasets" (2020)

Web links:

1) https://www.coursera.org/in/articles/big-data-analytics
2) https://www.geeksforgeeks.org/what-is-big-data-analy

24PBIT71 **DevOps lab**

L	T	P	O	C
0	0	2	1	1

Course Objectives:

To understand the fundamental principles of DevOps and its role in modern software development.

To gain practical knowledge of Continuous Integration (CI), Continuous Delivery (CD), and automation tools.

To explore containerization, orchestration, and infrastructure as code.

To assess the impact of DevOps practices on team collaboration and software lifecycle. To examine security considerations and best practices in DevOps environments.

LAB EXERCISES

1. Understanding Continuous Integration with Jenkins Setup.
2. DevOps Culture and Collaboration
3. Building a CI Pipeline with Jenkins/GitLab CI
4. Automating Testing in the CI/CD Pipeline
5. Repository Management and Branching Strategies with Git
6. Docker Basics – Creating and Running Containers
7. Multi-Container Applications with Docker Compose
8. Introduction to Kubernetes – Deploying a Simple Application
9. Microservices Architecture with Containers and Kubernetes
10. Configuration Management with Ansible
11. Integrating Security Testing in CI/CD (DevSecOps)
12. Monitoring and Logging with Prometheus and Grafana
13. Centralized Logging with the ELK Stack
14. Implementing Incident Management and Alerting

Reference Books

1. Gene Kim, Patrick Debois, John Willis, and Jez Humble, “The DevOps Handbook”IT Revolution Publications
2. Niall Richard Murphy, Betsy Beyer, Chris Jones, and Jennifer Petoff,”Site Reliability Engineering: How Google Runs Production Systems” O'Reilly Media Publications

24RBIT71 **RESEARCH PROJECT-I**

L	T	P	O	C
0	0	12	2	6

COURSE OBJECTIVES

The research projects program aims to:

1. Equip students with the ability to conduct independent and team-based research.
2. Develop skills in identifying, formulating, and solving complex research problems.
3. Enhance proficiency in research methodologies, tools, and techniques.
4. Foster critical thinking, innovation, and analytical reasoning.
5. Prepare students to publish and present their findings in academic or industrial forums.

COURSE MODULES

Module 1: Introduction to Research

- Understanding Research in Computer Science
- Types of Research: Exploratory, Descriptive, and Experimental
- Importance of Problem Identification and Research Questions

Module 2: Literature Review and Gap Analysis

- Techniques for Conducting a Literature Review
- Tools for Reference Management (e.g., Zotero, Mendeley)
- Identifying Gaps and Formulating Objectives

Module 3: Research Methodology

- Qualitative vs. Quantitative Research
- Data Collection Techniques (Surveys, Experiments, Simulations)
- Research Tools and Platforms (MATLAB, R, Python)

Module 4: Proposal Development

- Writing a Research Proposal
- Setting Goals, Deliverables, and Milestones
- Ethical Guidelines and Considerations

Module 5: Implementation and Experimentation

- Designing and Conducting Experiments
- Data Analysis and Interpretation
- Tools for Data Visualization (Tableau, matplotlib, Power BI)

Module 6: Documentation and Reporting

- Structuring Research Papers (Abstract, Introduction, Methods, Results, Conclusion)
- Writing Technical Reports and Presentations
- Formatting and Publishing in Journals/Conferences

Module 7: Final Project Presentation

- Developing Final Deliverables (Prototype, Model, or Software)
- Presentation to Peers and Evaluators
- Peer Reviews and Feedback Integration

Total: 180 Hours

COURSE OUTCOMES

Upon completing the research project course, students will be able to:

1. Identify and define research problems within a domain of interest.
2. Conduct thorough literature reviews and gap analyses.
3. Apply appropriate research methodologies and tools to explore solutions.
4. Develop and test hypotheses or prototypes based on research objectives.
5. Analyze and interpret research data effectively.
6. Present findings through well-structured reports, presentations, or publications.
7. Understand ethical considerations in research and intellectual property rights.
8. Collaborate effectively with peers and mentors to achieve research objectives.

SEMESTER VIII

24CBIT81 **NATURAL LANGUAGE PROCESSING**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

1. Introduce to some of the problems and solutions of NLP and their relation to linguistics and statistics.
2. To understand linguistic phenomena and learn to model them with formal grammars.
3. To understand and carry out proper experimental methodology for training and evaluating empirical NLP systems.
4. To learn how to manipulate probabilities, construct statistical models over string sand trees
5. To estimate parameters using supervised and unsupervised training methods.
6. To design, implement, and analyze NLP algorithms. Able to design different language Modelling Techniques.

UNIT –I: NATURAL LANGUAGE PROCESSING (NLP): 9 Hours

Introduction, Applications or Use cases of NLP-Components of NLP- Steps in NLP-Finding the Structure of Words: Words and Their Components-Lexemes, Morphemes, Morphology, Problems in morphological processing- Typology, Morphological Typology-Natural Language Processing with python NLTK package (Text Preprocessing Tasks): Word Tokenization-Sentence Tokenization, Filtering Stop words- Stemming, Tagging Parts of Speech-Lemmatization, Chunking, Chinking, Named Entity Recognition- Term Frequency and Inverse Document Frequency (TF-IDF).

UNIT–II: SYNTAX ANALYSIS: 9 Hours

Parsing Natural Language, Tree banks: A Data-Driven Approach to Syntax- Representation of Syntactic Structure: Syntax Analysis using Dependency Graph, Syntax Analysis using Phrase Structure Trees, Parsing Algorithms: Shift Reduce Parsing, Hyper Graphs and Chart Parsing (CYK Parsing), Models for ambiguity Resolution in Parsing: Probabilistic Context Free Grammar, Generative Models, Discriminative models for Parsing.

UNIT-III: LANGUAGE MODELING and SYNTACTIC ANALYSIS 9 Hours

Introduction, N-Gram Models, Language Model Evaluation, Parameter Estimation, Language Model Adaptation, Types of Language Models, Language-Specific Modeling Problems.

UNIT IV SEMANTICS AND PRAGMATICS 9 Hours

Requirements for representation, First-Order Logic, Description Logics – Syntax-Driven Semantic analysis, Semantic attachments – Word Senses, Relations between Senses, Thematic Roles, selection restrictions – Word Sense Disambiguation, WSD using Supervised, Dictionary & Thesaurus, Bootstrapping methods – Word Similarity using Thesaurus and Distributional Methods.

UNIT V DISCOURSE ANALYSIS AND LEXICAL RESOURCES 9 Hours

Discourse segmentation, Coherence – Reference Phenomena, Anaphora Resolution using Hobbs and Centering Algorithm – Coreference Resolution – Resources: Porter Stemmer, Lemmatizer, Penn Treebank, Brill's Tagger, WordNet, PropBank, FrameNet, Brown Corpus, British National Corpus (BNC).

Total: 45 Hours

COURSEOUTCOMES:

1. Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
2. Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems.
3. Able to manipulate probabilities, construct statistical models over strings and trees
4. Will be able to estimate parameters using supervised and unsupervised training methods.
5. Able to design, implement, and analyze NLP algorithms. Able to design different language modeling Techniques

TEXT BOOKS:

1. Daniel Jurafsky, James H. Martin—Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014

2. Steven Bird, Ewan Klein and Edward Loper, —Natural Language Processing with Python, First Edition, O'Reilly Media, 2009.

REFERENCE BOOKS:

1. Breck Baldwin, —Language processing with Java and LingPipe Cookbook, Atlantic Publisher, 2015.
2. Richard M Reese, —Natural Language Processing with Java‖, O'Reilly Media, 2015..
3. Nitin Indurkhya and Fred J. Damerau, —Handbook of Natural Language Processing, Second Edition, Chapman and Hall/CRC Press, 2010.
4. Tanveer Siddiqui, U.S. Tiwary, "Natural Language Processing and Information Retrieval", Oxford University Press, 2008

WEB SITES

1. https://www.cl.cam.ac.uk/teaching/2002/NatLangProc/nlp1-4.pdf
2. https://www.techtarget.com/searchenterpriseai/definition/natural-language-processing-NLP
3. https://www.cs.jhu.edu/~phi/ai/slides/lecture-natural-language-processing.pdf

24CBIT82 **NETWORK SECURITY**

L	T	P	O	C
3	0	0	2	3

COURSE OBJECTIVES:

1. To learn the fundamentals of cryptography
2. To learn the key management techniques and authentication approaches.
3. To explore the network and transport layer security techniques.
4. To understand the application layer security standards
5. To learn the real time security practices.

UNIT-I - INTRODUCTION: 9 hours

Attacks, Services, and Mechanisms – Security Attacks: Passive Attacks –Active Attacks – Security Services – Model for Internetwork Security – Internet Standards and RFCs: Internet Society – RFC Publication – Standardization Process – Non- Standardization Track Documents – Conventional Encryption and Message Confidentiality: Conventional Encryption Principles: Cryptography – Cryptanalysis – Feistel Cipher Structure – Conventional Encryption Algorithms – Cipher Blocks Models of Operation: Cipher Block Chaining Mode – Cipher Feedback Model – Location of Encryption Devices – Key distribution.

UNIT-II - PUBLIC KEY CRYPTOGRAPHY AND MESSAGE AUTHENTICATION

9 hours

Approaches to Message Authentication: Authentication using Conventional Encryption – Message Authentication without Message Encryption – Message Authentication Code – One Way Hash Function – Secure Hash Function and HMAC: Hash Function Requirements – Simple Hash Functions the SHA–1 Secure Hash Function – Other Secure Hash Functions – HMAC Design Objectives – HMAC Algorithm – Public Key Cryptography Principles: Public Key Encryption Structure Application for Public Key Cryptosystems – Requirements for Public Key Cryptography – Public Key Cryptography Algorithms: RSA Public Key Encryption Algorithms – Diffie-Hellman Key Exchange – Other Public Key Cryptography Algorithms – Digital Signature – Key Management. .

UNIT-III - ELECTRONIC MAIL SECURITY : 9 hours

Pretty Good Privacy (PGP): Notation – Operational Description – Cryptography Keys and Key Rings – Public Key Management – S/MIME: RFC 822 – Multipurpose Internet Mail Extensions – S/MIME Functionality – S/MIME Messages – S/MIME Certificate Processing – Enhanced Security Services – IP Security: IP Security Overview: Application of IPSec – Benefits of IPSec – Routing Applications – IP16S2ecurity Architecture: IPSec Documents –

IPSec Services – Security Associations – Transport and Tunnel Modes – Authentication Header – Encapsulating Security Payload – Combining Security Associations – Key Management: Oakley Key Determination Protocol – ISAKMP

UNIT-IV - WEB SECURITY: 9 hours

Web security Requirements: Web security Threats – Web Traffic Security Approaches – Secure Socket Layer (SSL) and Transport Layer Security (TLS): SSL Architecture – SSL Record Protocol – Change Cipher Spec Protocol – Alert Protocol - Handshake Protocol – Cryptographic Computations – Transport Layer Security – Secure Electronic Transaction (SET): SET Overview – Dual Signature – Payment Processing – Network Management Security: Basic Concepts of SNMP: Network Management Architecture – Network Management Protocol Architecture – Proxies – snmpv2 – snmpv1 Community Facility – snmpv3: SNMP Architecture – Message Processing and the User Security Model – View Based Access Control.

Unit-V - SYSTEM SECURITY: 9 hours

Intruders and Viruses: Intruders: Intrusion Techniques – Password Protection – Password Selection Strategies – Intrusions Detection – Viruses and Related Threats: Malicious Programs – The Nature of Viruses – Types of Viruses – Macro Viruses – Antiviruses Approaches – Advanced Antiviruses Techniques – Firewalls: Firewall Design Principles: Firewall Characteristics – Types of Firewalls – Firewall Configuration – Trusted Systems: Data Access Control – The Concept of Trusted Systems – Trojan Horse Defense.

COURSE OUTCOMES: Total: 45 Hours

1. Explain network security issues
2. Understand various threats and vulnerabilities of a network, and explain appropriate countermeasures
3. Perform simple penetration testing of a network and network services
4. Perform a threat analysis / vulnerability assessment of protocol designs and implementations
5. Design and implement appropriate defensive countermeasures against identified threats

and vulnerabilities

Text book:

1. William Stallings, Network Security Essentials, Prentice Hall, Third Edition, 2006.

Reference Books:

1. Manish Tiwari, Handbook of Network Security and Anti Terrorism Laws, Neha Publishers and Distributors, 2012.
2. Adesh K. Pandey, Network Security and Administration, S.K. Kataria and Sons, 2010

24CBIT83 INTELLECTUAL PROPERTY RIGHTS AND CYBER LAWS

L	T	P	O	C
4	0	0	2	4

COURSE OBJECTIVES:

To understand the concepts IPR

To understand Trademarks, Trade Secretes and GI of goods

To understand Copyrights, Patents and Industrial Designs.

To learn about how to manage IP rights and legal aspects.

To understand the concepts of Cyber laws in IPR.

UNIT – I: Introduction: **12 HOURS**

Introduction to Intellectual Property Rights, types of intellectual property, importance of intellectual property rights, Evolution of IP acts and treaties, Agencies responsible for IPR registrations, Role and value of IP in international commerce, Issues affecting IP internationally.

UNIT – II Trade Marks: **12 HOURS**

Purpose and function of trademarks, Acquisition of trade mark rights, transfer of rights, Selecting and evaluating trademark, registration of trademarks, claims.

Trade Secrets: Trade secret law, determination of trade secret status, liability for misappropriation of trade secrets, trade secret litigation.

Geographical Indication of Goods: Basic aspects and need for the registration.

UNIT – III Copyrights: **12 HOURS**

Fundamentals of copyright law, originality of material, right of reproduction, right to perform the work publicly, copyright ownership issues, notice of copyright. Patents: Foundation of patent law, patent searching process, Basic Criteria of Patentability Industrial Designs: Kind of protection provided in Industrial design.

UNIT – IV: Managing IP Rights: **12 HOURS**

Acquiring IP Rights: letters of instruction, joint collaboration agreement, Protecting IP Rights: non-disclosure agreement, cease and desist letter, settlement memorandum. Transferring IP Rights: Assignment contract, license agreement, deed of assignment.

UNIT- V Introduction to Cyber law: **12 HOURS**

Information Technology Act, cybercrime and e-commerce, data security, confidentiality, privacy, international aspects of computer and online crime.

Total: 60 hours

COURSE OUTCOMES:

1. Learner should be able to demonstrate understanding of basic concepts of IPR.
2. Able to differentiate between Trademarks, Trade secrets and GI of goods. Able to understand Copyrights, Patents and Industrial Designs..
3. Able to manage and protect IP
4. Will gain Knowledge on Cyber law

TEXT BOOKS:

1. Intellectual property right by Deborah E Bouchoux
2. Cyber law, Text and cases South western special topics collection
3. Intellectual property rights by N.K Acharya
4. Fundamentals of IPR for engineers, BY komal bansal

REFERENCES:

Intellectual property rights by P. Radhakrishnan.

WEB`LINKS

1.https://www.geeksforgeeks.org/intellectual-property-in-cyberspace/

2 https://ijarsct.co.in/Paper13427.pdf

3.https://www.legalserviceindia.com/legal/article-13557-intellectual-property-rights-in-the-cyber-space.html

24DBIT81 **Research Methodology**

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COURSE OBJECTIVES:

1. Introduce research paper writing and induce paper publication skills

.2. Give the introduction to Intellectual Property Rights

UNIT - I Introduction-Objective of Research **12**

Definition and Motivation; Types of Research; Research Approaches, Steps in Research Process; Criteria of Good Research; Ethics in Research. Research Formulation and Literature Review: Problem Definition and Formulation; Literature Review; Characteristics of Good Research Question; Literature Review Process.

UNIT - II Data Collection-Primary and Secondary Data **12**

Primary and Secondary Data Sources; Data Collection Methods;Data Processing; Classification of Data.Data Analysis-Statistical Analysis; Multivariate Analysis; Correlation Analysis; Regression Analysis; Principle Component Analysis; Samplings

UNIT - III Research Design-Need for Research Design **12**

Features of a Good Design; Types of Research Designs; Induction and Deduction. Hypothesis Formulation and Testing-Hypothesis; Important Terms; Types of Research Hypothesis; Hypothesis Testing; Z-Test;t-Test; f-Test; Making a Decision; Types of Errors; ROC Graphics.

UNIT - IV Test Procedures-Parametric and Non Parametric Tests **12**

ANOVA; Mann-Whitney Test; Kruskal-Wallis Test; Chi-Square Test; Multi-Variate Analysis. Presentation of the Research Work-Business Report; Technical Report; Research Report; General Tips for Writing Report; Presentation of Data; Oral Presentation; Bibliography and References; Intellectual Property Rights; Open-Access Initiatives; Plagiarism. .

UNIT - V Law of Patents, Patent Searches, Ownership, Transfer Patentability Design Patents: **12**

Double Patenting – Patent Searching – Patent Application Process – Prosecuting the Application, Post-issuance Actions, Term and Maintenance of Patents. Ownership Rights – Sole and Joint Inventors – Inventions Made by Employees and Independent Contractors – Assignment of Patent Rights – Licensing of Patent Rights – Invention Developers and

Infringement - Inducement to Infringe – Contributory Infringement – First Sale Doctrine – Claims Interpretation – Defenses to Infringement – Remedies for Infringement – Resolving an Infringement Dispute – Patent Infringement Litigation. New Developmentsin Patent Law.

Total: 60 hours

COURSE OUTCOMES:

1. Ability to distinguish research methods
2. Ability to write and publish a technical research paper.
3. Ability to review papers effectively.

. TEXT BOOKS:

1. Research Methodology. Methods & Technique : Kothari. C.R
2. Research Methodology, S.S Vinod Chandra, S Anand Hareendran, Pearson
3. Intellectual Property – Copyrights, Trademarks, and Patents by Richard Stim, Cengage Learning

REFERENCES:

1. Practical Research : planning and Design(8th Edition) – Paul D. Leedy and Jeanne E. Ormrod.
2. A Hand Book of Education Research – NCTE
3. Methodology of Education Research – K.S. Sidhu.
4. Tests, Measurements and Research methodsin Behavioural Sciences- A.K. Singh.
5. Statistical Methods- Y.P. Agarwal.
6. Methods of Statistical Ananlysis- P.S Grewal.
7. Fundamentals of Statistics – S.C. Gupta, V.K. Kapoor.
8. Intellectual Property Rights by Deborah E. Bouchoux, Cengage Learning.
9. Managing Intellectual Property – The Strategic Imperative, Vinod V.Sople, 2nd Edition, PHI Learning Private Limited.
10. Research methodology – S.S. Vinod Chandra, S. Anand Hareendran

24DBIT82 **IMAGE PROCESSING**

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COURSE OBJECTIVES:

1. To become familiar with digital image fundamentals & get exposed to simple imageenhancement techniques in Spatial and Frequency domain.
2. To learn concepts of degradation function and restoration techniques &study the imagesegmentation and representation techniques.
3. To become familiar with image compression and recognition methods

UNIT I - DIGITAL IMAGE FUNDAMENTALS 12

Steps in Digital Image Processing – Components – Elements of Visual Perception – Image Sensing and Acquisition – Image Sampling and Quantization – Relationships between pixels - Color image fundamentals - RGB, HSI models, Two-dimensional mathematical preliminaries, 2Dtransforms - DFT, DCT.

UNIT II IMAGE ENHANCEMENT SPATIAL DOMAIN: 12

Gray level transformations – Histogram processing – Basics of Spatial Filtering–Smoothing and Sharpening Spatial Filtering, Frequency Domain: Introduction to Fourier Transform– Smoothing and Sharpening frequency domain filters – Ideal, Butterworth and Gaussian filters, Holomorphic filtering, Color image enhancement.

UNIT III IMAGE RESTORATION 12

Image Restoration - degradation model, Properties, Noise models – Mean Filters – Order Statistics –Adaptive filters – Band reject Filters – Band pass Filters – Notch Filters – OptimumNotchFiltering – Inverse Filtering – Wiener filtering.

UNIT IV IMAGE SEGMENTATION 12

Edge detection, Edge linking via Hough transform – Thresholding - Region based segmentation– Region growing – Region splitting and merging – Morphological processing- erosion and dilation, Segmentation by morphological watersheds – basic concepts – Dam construction – Watershed segmentation algorithm.

UNIT V IMAGE COMPRESSION AND RECOGNITION 12

Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, JPEGstandard, MPEG. Boundary representation, Boundary description, Fourier Descriptor, Regional Descriptors – Topological feature, Texture - Patterns and Pattern classes -

Total: 60 Hours

COURSE OUTCOMES:

1. Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.
2. Operate on images using the techniques of smoothing, sharpening and enhancement &understand the restoration concepts and filtering techniques.
4. Learn the basics of segmentation, features extraction, compression and recognition methods for color models.

TEXT BOOKS:

1. Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing, Pearson, 3Edition, 2010.
2. Anil K. Jain, Fundamentals of Digital Image Processing, Pearson, 2002.

REFERENCES

1. Kenneth R. Castleman, Digital Image Processing, Pearson, 2006.
2. Rafael C. Gonzalez, et al, Digital Image Processing using MATLAB, Pearson 20
3. D,E. Dudgeon et al, Multidimensional Digital Signal Processing, Prentice Hall Professional Technical Reference, 1990.
4. William K. Pratt, Digital Image Processing, John Wiley, New York, 2002
5. Milan Sonka et al,Image processing, analysis and machine vision, Brookes/Cole, Vikas Publishing House, 2nd edition, 1999

Weblinks:

1. https://www.imageprocessingplace.com
2. https://www.ipol.im
3. https://www.ipol.im/

24PBIT81 NATURAL LANGUAGE PROCESSING LAB

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COURSE OBJECTIVE:

1. Make use of Data sets in implementing the machine learning algorithms
2. .Implement the machine learning concepts and algorithms in any suitable language of choice.

LIST OF EXPERIMETS

1. Installation and exploring features of NLTK and spaCy tools. Download Word Cloud and few corpora.
2. (i)Write a program to implement word Tokenizer, Sentence and Paragraph Tokenizers.
   (ii) Check how many words are there in any corpus. Also check how many distinct words are there?
3. (i) Write a program to implement both user-defined and pre-defined functions to generate
   (a) Uni-grams (b) Bi-grams (c) Tri-grams (d) N-grams (ii) Write a program to
   (b) calculate the highest probability of a word (w2) occurring after another
   (c) word(w1).
4. (i)Write a program to identify the word collocations.
   (ii) Write a program to print all words beginning with a given sequence of letters.
   (iii) Write a program to print all words longer than four characters.
5. (i) Write a program to identify the mathematical expression in a given sentence.
   (ii) Write a program to identify different components of an email address.
6. (i) Write a program to identify all antonyms and synonyms of a word.
   (ii) Write a program to find hyponymy, homonymy, polysemy for a given word.
7. (i) Write a program to find all the stop words in any given text.
   (ii) Write a function that finds the 50 most frequently occurring words of a text that are not stopwords.
8. Write a program to implement various stemming techniques and prepare a chart with the performance of each method. `
9. Write a program to implement various lemmatization techniques and prepare a chart with the performance of each method.
10. (i) Write a program to implement Conditional Frequency Distributions(CFD) for any corpus.
    (ii) Find all the four-letter words in any corpus. With the help of a frequency distribution (FreqDist), show these words in decreasing order of frequency.

(iii) Define a conditional frequency distribution over the names corpus that allows you to see which initial letters are more frequent for males versus females.

11. (i) Write a program to implement Part-of-Speech (PoS) tagging for any corpus.
12. Write a program to implement TF-IDF for any corpus.
13. Write a program to implement chunking and chinking for any corpus.
14. Write a program to find all the mis-spelled words in a paragraph. (ii) Write a program to prepare a table with frequency of mis-spelled tags for any given text.
15. Write a program to implement all the NLP Pre-Processing Techniques required to perform further NLP tasks.

Case Studies: (At Least any one Case Study has to be performed)

Case Study-1. Write a program to implement Named Entity Recognition (NER) for any corpus.

Case Study-2. Write a program to perform Auto-Correction of spellings for any text.

Case Study-3. Check for all positive words in a news article/ any text.

TOTAL: 15 HOURS

REFERENCE BOOKS:

1. ToolkitSteven Bird, Ewan Klein, and Edward Loper, “Natural Language Processing with Python – Analyzing Text with the Natural Language”.

WEB REFERENCES:

1. http://www.nptelvideos.in/2012/11/natural-languageprocessing.html

24PBIT82 **NETWORK SECURITY LAB**

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COURSE OBJECTIVES

1. To Understand Cryptographic Algorithms:
2. To Secure Communication Protocols:
3. To Simulate Cybersecurity Threats:
4. To Network Traffic Analysis:
5. To Develop a Security Mindset

LIST OF EXPERIMETS

1. Implement symmetric key algorithms
2. Implement Asymmetric Key Algorithms And Key Exchange Algorithms – Rsa Algorithm
3. Implement Asymmetric Key Algorithms And Key Exchange Algorithms – Diffie- Hellmankeyexchangealgorithm
4. Implement Digital Signature Schemes Installation Of Wire Shark, Tcpdump And Observe Data Transferred In Client-Server Communication Using Udp/Tcp And Identify The Udp/Tcp Datagram
5. Check Message Integrity And Confidentiality Using Ssl
6. Experiment Eavesdropping, Dictionary Attacks, Mitm Attacks
7. Experiment With Sniff Traffic Using Arp Poisoning
8. Demonstrate Intrusion Detection System
9. Using Snort Software Tool Explore Network Monitoring Tools
10. Study To Configure Firewall, Vpn

TOTAL: 15 HOURS

COURSE OUTCOMES:

CO1: Demonstrate the implementation of symmetric and asymmetric cryptographic algorithms to ensure data confidentiality and secure communication.

CO2: Develop and implement digital signature schemes to ensure data integrity and authenticity.

CO3: Analyze and capture network traffic using tools like Wireshark and TCPDump, and interpret TCP/UDP datagrams in client-server communication.

CO4: Apply secure protocols (e.g., SSL/TLS) to ensure message integrity and confidentiality in communication systems.

CO5: Investigate and simulate real-world cybersecurity attacks such as eavesdropping, dictionary attacks, and man-in-the-middle (MITM) attacks, and analyze their impact.

REFERENCE BOOKS:

1. William Stallings,"Cryptography and Network Security"7th Edition, Pearson Publisher
2. Bruce Schneier."Applied Cryptography: Protocols, Algorithms, and Source Code in C"second Edition,Wiley Publisher

24RBIT81 **RESEARCH PROJECT-II**

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COURSE OBJECTIVES

The research projects program aims to:

1. Equip students with the ability to conduct independent and team-based research.
2. Develop skills in identifying, formulating, and solving complex research problems.
3. Enhance proficiency in research methodologies, tools, and techniques.
4. Foster critical thinking, innovation, and analytical reasoning.
5. Prepare students to publish and present their findings in academic or industrial forums.

COURSE MODULES

Module 1: Introduction to Research

- Understanding Research in Computer Science
- Types of Research: Exploratory, Descriptive, and Experimental
- Importance of Problem Identification and Research Questions

Module 2: Literature Review and Gap Analysis

- Techniques for Conducting a Literature Review
- Tools for Reference Management (e.g., Zotero, Mendeley)
- Identifying Gaps and Formulating Objectives

Module 3: Research Methodology

- Qualitative vs. Quantitative Research
- Data Collection Techniques (Surveys, Experiments, Simulations)
- Research Tools and Platforms (MATLAB, R, Python)

Module 4: Proposal Development

- Writing a Research Proposal
- Setting Goals, Deliverables, and Milestones
- Ethical Guidelines and Considerations

Module 5: Implementation and Experimentation

- Designing and Conducting Experiments
- Data Analysis and Interpretation
- Tools for Data Visualization (Tableau, matplotlib, Power BI)

Module 6: Documentation and Reporting

- Structuring Research Papers (Abstract, Introduction, Methods, Results, Conclusion)
- Writing Technical Reports and Presentations
- Formatting and Publishing in Journals/Conferences

Module 7: Final Project Presentation

- Developing Final Deliverables (Prototype, Model, or Software)
- Presentation to Peers and Evaluators
- Peer Reviews and Feedback Integration

Total: 180 Hours

COURSE OUTCOMES

Upon completing the research project course, students will be able to:

1. Identify and define research problems within a domain of interest.
2. Conduct thorough literature reviews and gap analyses.
3. Apply appropriate research methodologies and tools to explore solutions.
4. Develop and test hypotheses or prototypes based on research objectives.
5. Analyze and interpret research data effectively.
6. Present findings through well-structured reports, presentations, or publications.
7. Understand ethical considerations in research and intellectual property rights.
8. Collaborate effectively with peers and mentors to achieve research objectives.