JAYARAJ ANNAPACKIAM COLLEGE FOR WOMEN (AUTONOMOUS)

A Unit of the Sisters of St. Anne of Tiruchirappalli
Accredited with 'A+' Grade (Cycle 4) by NAAC
DST FIST Supported College
Affiliated to Mother Teresa Women's University, Kodaikanal

PERIYAKULAM – 625 601, THENI DT. TAMIL NADU.

COMPUTER APPLICATIONS

(2023-2026)

DEPARTMENT OF COMPUTER APPLICATIONS

BCA SYLLABUS (2023-2026)

Bachelor of Computer Applications (BCA) is the study of algorithmic processes, computational machines, and computation itself. As a discipline, BCA spans a range of topics from theoretical studies of algorithms, computation, and information to the practical issues of implementing computational systems in hardware and software. The BCA curriculum and the knowledge of the practical application of the subjects will help students to apply their knowledge in the future course of their higher education, career or research. To cope with the industry needs, demands, and the advancement of technology the students are expected to have expertise in each subject.

As per the guidelines of the University Grant Commission (UGC), Tamil Nadu State Council for Higher Education (TANSCHE) and Mother Teresa Women's University, Kodaikanal, the curriculum, teaching pedagogy, and assessment methods are assigned with appropriate K LEVELs as per BLOOM's Taxonomy. The OBE-based evaluation methods will pave way for the assessment of the K LEVELs of the students and evaluate the expected course outcome attainment. It provides ample choice of courses of study to the students, based on Weighted Credit Point System. In addition to the core courses in their respective discipline, the learners are offered a number of complementary job-oriented and Skill Enhancement Courses under Discipline Specific and General Elective Courses.

Mobile Application Development Lab (23CA5CP06): In the V semester, the Mobile Application Development Lab course has two hours for theory and four hours for the lab. As it is a lab paper, the examination is conducted for the practical component alone.

EXTRA CREDIT COURSES

MOOC: According to the guidelines of UGC, the students are encouraged to avail this option of enriching their knowledge by enrolling themselves in the Massive Open Online Courses (MOOC) provided by various portals such as SWAYAM, NPTEL, etc. In order to facilitate the students, gaining knowledge/skills by attending MOOC courses, extra credits are awarded after verifying the course completion certificate.

Naan Mudhalvan Course: The students are encouraged to opt any course provided by the Naan Mudhalvan Scheme of Tamil Nadu government. The students can earn extra credits after completing the course successfully.

Self-Study Course: It is a course for two credits. It is offered to promote the habit of independent/self-learning of students. It is not taught in the regular working hours.

Internship: Students must complete internship during summer holidays after the fourth semester. They have to submit a report of internship training with the necessary documents and have to appear for a viva-voce examination during the fifth semester. Credit for internship will be entered in the fifth semester's mark statement.

PATTERN OF EVALUATION

For each paper there will be Continuous Internal Assessment (CIA) and Semester Examination (External). The Weightage ratio is:

Paper	Internal	External	Total
Theory	25	75	100
Practical	40	60	100
Project	50	50	100
Internship	50	50	100
Self-Study Course	-	100	100
Fully Internal Papers	100	-	100

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - 2023-2026

CIA components for Practical can be decided by the respective Departments. Passing Minimum in the Continuous Internal Assessment is Compulsory for appearing the External Semester Examination.

CIA COMPONENTS OF THEORY

Component	Marks	Marks
Internal test I	40	Converted to 25
Internal test II	40	
Quiz	10	
Assignment	5	
Attendance	5	
Total	**100**	**25**

INTERNAL COMPONENTS OF PRACTICAL

COMPONENTS	BLOOM'S LEVEL	MARKS DISTRIBUTION
Lab Attendance	K1	5
Observation Record	K2	10
Implementation	K3	5
Internal Test	K4	15
Viva	K5	5
Total		**40**

EXTERNAL COMPONENTS OF PRACTICAL

COMPONENTS	BLOOM'S LEVEL	MARKS DISTRIBUTION
Record	K1	10
Procedure	K2	10
Implementation	K3	10
Output	K4	20
Viva	K5	10
Total		**60**

THE COMPONENTS OF PROJECT

Internal		**External**	
Components	**Marks**	**Components**	**Marks**
First Review	10	Project Report	25
Second Review	10	Project Viva-Voce	25
Final Review (Internal Viva Voce)	30	---	
Total	**50**	**Total**	**50**

INTERNSHIP COMPONENTS

Components	Marks
Report Submission (K1=5, K2=10, K3 =10)	25
Presentation and viva (Internal) (K1=5, K2=5, K3=5, K4=5, K5=5)	25
External (Awarded by the Respective Guide/Intern site)	50
Total	**100**

COMPONENTS FOR FULLY INTERNAL LAB

COMPONENT		MARK
Internal Test -I (K1=5, K2=5, K3=5, K4=5, K5 =10)	**K5**	30
Internal Test -II (K1=5, K2=5, K3=5, K4=5, K5 =10)	**K5**	30
Lab Work (K1=5, K2=5, K3=10)	**K3**	20
Record (K1=5, K2=10)	**K2**	15
Attendance (K1 =5)	**K1**	05
	Total	**100**

PASSING MINIMUM FOR EXTERNAL SEMESTER EXAMINATION

Semester Examination		
Theory	40% out of 75 Marks (i.e. 30 Marks)	40% out of 100 Marks (i.e. 40 Marks)
Practical	40% out of 60 Marks (i.e. 24 Marks)	

SKILL DEVELOPMENT PROGRAMME (SDP) (CERTIFICATE COURSE)
GANDHIAN THOUGHT

Code	Title of the Course	Hours	Credit
CCHYGT01	Life of Mahatma Gandhi	60	2
CCHYGT02	Non-Violence and Sarvodaya		

SKILL DEVELOPMENT PROGRAMME (SDP)

GRAPHICS DESIGNING

Theory 30 Hours, Practical 30 Hours: Total 60 Hours

Code	Title	Hours	Credit
24CA1SD01	Graphics Designing	2	1
24CA1SDP1	Graphics Designing - Lab	2	1
	Total (15 Weeks x 4 = 60 Hours)	**4**	**2**

INTERNAL QUESTION PATTERN - UG (2023-2026)

Max. Marks - 40 **Duration - 2 Hours**

Section	Bloom's level	Course Outcome	Questions
A MCQs (10×1=10)	K1	CO1	1.
		CO1	2.
		CO1	3.
		CO1	4.
		CO1	5.
		CO1	6.
		CO1	7.
		CO1	8.
		CO1	9.
		CO1	10.
B Answer all the Questions (2×5=10)	K2	CO2	11. a) (or) 11. b)
	K3	CO3	12. a) (or) 12. b)
C Answer all the questions (2×10=20)	K4	CO4	13. a) (or) 13. b)
	K5	CO5	14. a) (or) 14. b)

INTERNAL QUESTION PATTERN (Fully Internal Papers) - UG (2023-2026)

Max. Marks - 40 **Duration - $1\frac{1}{2}$ Hours**

Section	Bloom's level	Course Outcome	Questions
A MCQs (10×1=10)	K1	CO1	1.
		CO1	2.
		CO1	3.
		CO1	4.
		CO1	5.
		CO1	6.
		CO1	7.
		CO1	8.
		CO1	9.
		CO1	10.
B Answer all the Questions (2×5=10)	K2	CO2	11. a) (or) 11. b)
	K3	CO3	12. a) (or) 12. b)
C Answer all the questions (2×10=20)	K4	CO4	13. a) (or) 13. b)
	K5	CO5	14. a) (or) 14. b)

UG - EXTERNAL QUESTION PATTERN

For Credits 5 and above

Sections	Bloom's level	Course Outcome	Questions
A MCQs 15×1=15	K1	CO1	1
			2
			3
			4
			5
			6
			7
			8
			9
			10
			11
			12
			13
			14
			15
B Answer All the Questions 5×2=10	K2	CO2	16
			17
			18
			19
			20
C Answer ALL the Questions 5×5=25	K1	CO1	21. a)
			Or
			21. b)
	K2	CO2	22. a)
			Or
			22. b)
	K3	CO3	23. a)
			Or
			23. b)
	K4	CO4	24. a)
			Or
			24. b)
	K5	CO5	25. a)
			Or
			25. b)

D Answer All the Questions 5×10=50	K1	CO1	26. a)
			Or
			26. b)
	K2	CO2	27. a)
			Or
			27. b)
	K3	CO3	28. a)
			Or
			28. b)
	K4	CO4	29. a)
			Or
			29. b)
	K5	CO5	30. a)
			Or
			30. b)

UG - EXTERNAL QUESTION PATTERN

For Below 5Credits

Sections	Bloom's level	Course Outcome	Questions
A MCQs 15×1=15	K1	CO1	1
			2
			3
			4
			5
			6
			7
			8
			9
			10
			11
			12
			13
			14
			15
B Answer ALL the Questions 5×6=30	K1	CO1	16. a)
			Or
			16. b)
	K2	CO2	17. a)
			Or
			17. b)
	K3	CO3	18. a)
			Or
			18. b)
	K4	CO4	19. a)
			Or
			19. b)
	K5	CO5	20. a)
			Or
			20. b)
C Answer All the Questions 3×10=30	K2	CO2	21. a)
			Or
			21. b)
	K3	CO3	22. a)
			Or
			22. b)
	K4	CO4	23. a)
			Or
			23. b)

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate

SKILL DEVELOPMENT PROGRAMME (SDP)

GRAPHICS DESIGNING - 24CA1SD01

Question Pattern for Internal Exam – 40 marks

Section	Questions	Marks
Part A	10 Questions	1 x 10 = 10 marks
Part B	2 Questions (either or choice)	2 x 5 = 10 marks
Part C	2 Questions (out of 4)	2 x 10 = 20 marks

GRAPHICS DESIGNING - 24CA1SD01

Question Pattern for External Exam – 75 marks

Section	Questions	Marks
Part A	15 Questions	1 x 15 = 15 marks
Part B	5 Questions (either or choice)	5 x 6 = 30 marks
Part C	3 Questions (out of 5)	3 x 10 = 30 marks

CERTIFICATE COURSE
SDP - EXTERNAL QUESTION PATTERN

SECTION – A	
Answer All Question	**(15 X 1 = 15)**
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
SECTION - B	
Answer All Question.	**(5X 6 = 30)**
16.	16. a (OR) 16. b
17.	17. a (OR) 17. b
18.	18. a (OR) 18. b
19.	19. a (OR) 19. b
20.	20. a (OR) 20. b
SECTION – C	
Answer Any Three Question.	**(3 X 10 =30)**
21.	
22.	
23.	
24.	
25.	

PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
PO-1	Apply scientific knowledge to real life situations to become competent and committed.
PO-2	Acquire Industry specific skills and equip them to emerge as entrepreneurs.
PO-3	Explore the knowledge and acclimatize it in the ever-changing work environment.
PO-4	Design and conduct experiments /demos/create models to analyze and interpret data
PO-5	Communicate effectively on the findings of sciences and incorporate with existing knowledge
PO-6	Evolve theories and develop innovative discipline specific ideas.

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO Addressed
PSO-1	Acquire a depth and rigorous knowledge on software development and problem-solving skills leading to innovation, permutation, modernization and research to fulfill global interest.	PO-6
PSO-2	Explore technical comprehension in varied areas of Computer Applications and experience a conducive environment in cultivating skills for thriving career and higher studies.	PO-3 PO-5
PSO-3	Evaluate the use of contemporary techniques, skills and tools necessary for integrated solutions.	PO-4
PSO-4	Equip themselves to be potentially rich entrepreneurs and employable in Indian and global software market.	PO-2
PSO-5	Implement the solutions for computer applications for the betterment of society keeping the environmental context in mind and be aware of professional ethics.	PO-1

BCA COURSE PATTERN (2023-2026) (UGC/TANSCHE/MTU)

Sem.	Part	Code	Title of the Course	Hours	Credits
I	I	23GT1GS01/ 23GH1GS01	Tamil/ Hindi	6	3
	II	23GE1GS01	English -I	4	3
	III	23CA1MC01	Object Oriented Programming Concepts using C++	5	5
		23CA1CP01	C++ Programming Lab	5	3
		23CA1AC1A 23CA1AC1B	**Elective Course-I: Allied Mathematics-I**: Discrete Mathematics Computer Oriented Numerical Methods	4	3
		23CA1AP01	Office Automation Lab	2	1
	IV	23AE1PE01	**Ability Enhancement Course-I (AEC -I)** Professional English #	2	2
		23CA1FC01	**Foundation Course:** Computer Fundamentals #	2	2
	V	23STPNS01/ 23STPNC01/ 23STPPE01/ 23STPCC01/ 23STPRR01/ 23STPRC01	**Students Training Programme:** National Service Scheme National Cadet Corps Physical Education Consumer Club Red Ribbon Club Youth Red Cross	-	-
			Total	**30**	**22**
II	I	23GT2GS02/ 23GH2GS02	Tamil/ Hindi	6	3
	II	23GE2GS02	English - II	4	3
	III	23CA2MC02	Python Programming	4	4
		23CA2MC03	Web Technology	3	3
		23CA2CP02	Python Programming Lab	4	3
		23CA2AC2A 23CA2AC2B	**Elective Course-II: Allied Mathematics-II**: Statistical Methods and its Applications Graph Theory	3	3
		23CA2AP02	Web Designing Lab	2	1
	IV	23AE2VE02	**Ability Enhancement Course-2 (AEC -2)** Sustainability Life Skills #	2	2
		23SE2CE02	**Skill Enhancement Course -1 (SEC-1):** Effective English #	2	2
	V	23STPNS01/ 23STPNC01/ 23STPPE01/ 23STPCC01/ 23STPRR01/ 23STPRC01	**Students Training Programme:** National Service Scheme National Cadet Corps Physical Education Consumer Club Red Ribbon Club Youth Red Cross	-	-
			Total	**30**	**24**

Sem.	Part	Code	Title of the Course	Hours	Credits
III	I	23GT3GS03/ 23GH3GS03	Tamil-III/ Hindi-III	6	3
	II	23GE3GS03	English - III	4	3
	III	23CA3MC04	Data Structure and Algorithms	5	5
		23CA3CP03	Data Structure and Algorithms Lab	4	3
		23CA3AC3A 23CA3AC3B	**Elective Course-III** Database Management System Computer Graphics	4	4
		23CA3AP03	RDBMS Lab	2	1
	IV	23SE3CA03	**Skill Enhancement Course -2 (SEC-2):** Advanced Excel #	1	1
		23CA3GE01/ 23GE3NC01	**General Elective-I** Animation Lab # National Integration and Personality Development#	2	2
		23AE3ES03	**Ability Enhancement Course-3 (AEC -3)** Environmental Studies #	2	2
	V	23STPNS01/ 23STPNC01/ 23STPPE01/ 23STPCC01/ 23STPRR01/ 23STPRC01	**Students Training Programme:** National Service Scheme National Cadet Corps Physical Education Consumer Club Red Ribbon Club Youth Red Cross	-	-
			Total	**30**	**24**
IV	I	23GT4GS04/ 23GH4GS04	Tamil-IV/ Hindi-IV	6	3
	II	23GE4GS04	English - IV	4	3
	III	23CA4MC05	Programming in Java	4	4
		23CA4CP04	Programming in Java Lab	4	3
		23CA4AC4A 23CA4AC4B	**Elective Course-IV** Datamining and Warehousing Big Data Analytics	4	4
		23CA4AP04	PHP Programming	2	1
	IV	23SE4OA4A	**Skill Enhancement Course -3 (SEC-3):** Multimedia Lab #	3	2
		23CA4GE02/ 23GE4NC02	**General Elective-II** Photo Editing Lab # Organization and Health Programme in NCC #	2	2
		23AE4CB04	**Ability Enhancement Course-4 (AEC -4)** Capacity Building #	1	1
	V	23STPNS01/ 23STPNC01/ 23STPPE01/ 23STPCC01/ 23STPRR01/ 23STPRC01	**Students Training Programme:** National Service Scheme National Cadet Corps Physical Education Consumer Club Red Ribbon Club Youth Red Cross	-	1*
			Total	**30**	**23+1***

Sem.	Part	Code	Title of the Course	Hours	Credits
V	III	23CA5MC06	Operating System	4	4
		23CA5MC07	.NET Programming	4	4
		23CA5MC08	Optimization Techniques	4	3
		23CA5CP05	.NET Programming Lab	4	2
	III	23CA5CP06	Mobile Application Development Lab	2+4	3
		23CA5DE1A 23CA5DE1B 23CA5DE1C	**Discipline Specific Elective-I** Software Engineering Software Project Management Agile Project Management	4	3
		23CA5DE2A 23CA5DE2B 23CA5DE2C	**Discipline Specific Elective-II** Introduction to Data Science Machine Learning Techniques Computational Intelligence	4	3
	IV	23CA5IN01	Internship #	-	2
	V	23SLPEX01	**Service-Learning Programme:** Extension JACEP #	-	-
			Total	**30**	**24**
VI	III	23CA6MC09	Computer Networks	5	5
		23CA6MC10	Data Analytics using R Programming (Theory: 4, Lab:2)	6	4
		23CA6MC11	IoT and its Applications	4	4
		23CA6PR01	Project	8	5
		23CA6DE3A 23CA6DE3B 23CA6DE3C	**Discipline Specific Elective-III** Information Security Cloud Computing Digital Image Processing	4	3
	IV	23SE6CA04	**Skill Enhancement Course -4 (SEC-4)** Open-Source Technologies #	3	2
	V	23CA6SS01/ 23CA6SS02/ 23CA6SS03/ 23CA6SS04/ 23CA6SS05	**Self-Study Course:** Multimedia Systems Human Computer Interaction Enterprise Resource Planning MOOC Certificate Naan Mudhalvan Course	-	2*
	V	23SLPEX01	**Service-Learning Programme:** Extension (JACEP) #	-	1*
			Total	**30**	**23+3***
			Total	**180**	**140+4***

*** Extra Credits**

 # Fully Internal Papers

பொதுத்தமிழ் - 1 (பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: ஒன்று **நேரம்: 6**

குறியீடு: 23GT1GS01 **புள்ளி: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	பாரதியார் காலந்தொட்டு தற்காலப் புதுக்கவிதைகள் வரை கவிதை இலக்கியம் அறிமுகப்படுத்தப்படுவதால் படைப்பாற்றல் திறன் அறிந்து கொள்வர்.	PSO-1	K1
CO - 2	புதுக்கவிதை வரலாற்றினை புரிந்து கொள்வார்.	PSO-5	K2
CO - 3	இக்கால இலக்கிய வகையினைக் கற்பதன் மூலம் படைப்பாக்கத் திறனைப் பெறுவர்.	PSO-2	K3
CO - 4	இக்கால இலக்கிய மொழியறிவோடு சிந்தனைத் திறன் அடையும் ஆற்றலை உணர்வர்.	PSO-3	K4
CO - 5	நவீன இலக்கிய உத்திகளைப் பயன்படுத்தி தமிழ் மொழியைப் பிழையின்றி எழுதவும், புதிய கலைச்சொற்களை உருவாக்கும் திறன் பெறுவர்.	PSO-4	K5

K1- நினைவு கூர்தல் K2-புரிதல், K3- பயன்படுத்துதல், K4 - பகுத்தல், K5 - மதிப்பீடு,

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I							பொதுத்தமிழ் - 1 (பிற துறை மாணவிகளுக்கு மட்டும்)					**Hours: 6**
Code : 23GT1GS01												**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	5	2	3	3	3	5	3	2	3	3	3.18
CO - 2	4	3	3	5	3	3	3	3	3	4	5	3.55
CO - 3	3	4	3	3	5	5	4	5	3	3	3	3.73
CO- 4	3	4	5	3	3	3	4	3	5	3	3	3.55
CO - 5	5	3	3	3	3	3	3	3	3	5	3	3.36
Overall Mean Score												**3.47**

Result: The score for this course is **3.47** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

அலகு 1: மரபுக் கவிதை

1. பெ. சுந்தரனார் - தமிழ்த் தெய்வ வணக்கம்
2. பாரதிதாசன் - சிறுத்தையே வெளியில் வா
3. கவிமணி - புத்தரும் சிறுவனும்
4. முடியரசன் - மொழி உணர்ச்சி
5. கண்ணதாசன் - ஆட்டனத்தி ஆதிமந்தி (ஆதிமந்தி புலம்பல்)
6. சுரதா - துறைமுகம்
7. தமிழ் ஒளி - கடல் **18 Hours**

அலகு 2: புதுக்கவிதை

1. அப்துல் ரகுமான் - வீட்டுக்கொரு மரம் வளர்ப்போம்
2. ஈரோடு தமிழன்பன் - ஒரு வண்டி சென்ரியூ கவிதைகள் - (ஐந்து மட்டும்)
3. வைரமுத்து - வேறென்ன வேண்டும்
4. மு. மேத்தா - வாழைமரத்தின் சபதம்
5. அறிவுமதி - வள்ளுவம் பத்து
6. நா. முத்துக்குமார் - ஆனந்த யாழை மீட்டுகிறாய்
7. சுகிர்தராணி - சபிக்கப்பட்ட முத்தம்
8. இளம்பிறை - நீ எழுத மறுக்கும் எனது அழகு **18 Hours**

அலகு 3: சிறுகதைகள்

1. ஜெயகாந்தன் - வாய்ச்சொற்கள்
2. புதுமைப்பித்தன் - கடிதம்
3. உமா மகேஸ்வரி - கரு
4. தி. ஜானகிராமன் - முள்முடி
5. விழி பா. இதயவேந்தன் - சிதறல்கள்
6. சு. சமுத்திரம் - காகிதஉறவு
7. அம்பை - வீட்டின் மூலையில் சமையல் அறை
8. மலையாளச் சிறுகதைகள் - செப்புமொழிபதினெட்டுடையாள் - (மொழிபெயர்ப்புக் கதை) தந்தையும் மகனும் **18 Hours**

அலகு 4: பாடம் சார்ந்த இலக்கிய வரலாறு **18 Hours**

அலகு 5: மொழித்திறன் போட்டித் தேர்வு

1. பொருள் பொதிந்த சொற்றொடர் அமைத்தல்
2. ஓர் எழுத்து ஒரு மொழி
3. வேற்றுமை - உருபுகள்
4. திணை, பால், எண், இடம்
5. கலைச்சொல்லாக்கம், மொழிபெயர்ப்பு **18 Hours**

(குறிப்பு: அலகு 4, 5 ஆகியன போட்டித் தேர்வு நோக்கில் நடத்தப்பட வேண்டும்)

பாட நூல்கள்

1. தமிழ்த்துறை வெளியீடு (தொகுப்பு) - பொதுத்தமிழ் - 1
   ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி
   (தன்னாட்சி), பெரியகுளம்.
2. முனைவர் சி. பாலசுப்பிரமணியன் - தமிழ் இலக்கிய வாலாறு,
   பாவை பப்ளிகேஷன்ஸ், சென்னை - 60
   இரண்டாம் பதிப்பு - 2016.

பார்வை நூல்கள்:

1. பெ. சுந்தரனார் - மனோன்மணீயம்
   நியூ செஞ்சுரி புக் ஹவுஸ்
   சென்னை.
2. முடியரசன் - முடியரசன் கவிதைகள்,
   பாரிநிலையம்,
   சென்னை.
3. பாரதிதாசன் - பாரதிதாசன் கவிதைகள்,
   மணிவாசகர் பதிப்பகம்,
   சென்னை
4. கவிமணி - ஆசிய ஜோதி
   பாவை பப்ளிகேஷன்ஸ்
   சென்னை.
5. கண்ணதாசன் கவிதைகள் - ஆட்டனத்தி ஆதிமந்தி
   வானதி பதிப்பகம்,
   சென்னை.
6. வைரமுத்து - வைரமுத்து கவிதைகள்
   திருமகள் நிலையம்,
   சென்னை.
7. மு. மேத்தா - மு. மேத்தா கவிதைகள்,
   கவிதா வெளியீடு,
   சென்னை.
8. கவிஞர் சிற்பி - சிற்பியின் கவிதை வானம்,
   மணிவாசகர் பதிப்பகம்,
   சென்னை.
9. நா. முத்துக்குமார் - ஆனந்த யாழை மீட்டுகிறாய்
   இணையவழி தகவல் திரட்டு
10. சுகிர்தாராணி - சபிக்கப்பட்ட முத்தம்
    இணையவழி தகவல் திரட்டு
11. ஜெயகாந்தன் - ஜெயகாந்தன் சிறுகதைகள்,
    கவிதா பப்ளிகேஷன்ஸ்,
    சென்னை.

12. ச. சுபாஷ் சந்திரபோஸ் (தொகுப்பாசிரியர்) - புதுமைப்பித்தன் சிறுகதைகள், பாவை பப்ளிகேஷன்ஸ், சென்னை.

13. தி. ஜானகிராமன் - தி. ஜானகிராமன் படைப்புகள், ஐந்திணைப் பதிப்பகம், சென்னை.

14. சு. சமுத்திரம் - சு. சமுத்திரம் கதைகள், ராஜராஜன் பதிப்பகம், சென்னை.

15. தமிழாக்கம் கோ. பிச்சை - செப்புமொழி பதினெட்டுடையாள், நியூசெஞ்சுரி புக் ஹவுஸ், சென்னை.

16. சி. பாலசுப்பிரமணியன், - தமிழ் இலக்கிய வரலாறு பாவை பப்ளிகேஷன்ஸ், சென்னை - 600 014.

17. புலவர் குழந்தை - மாணவர் அடிப்படைத் தமிழ் இலக்கணம், சாரதா பதிப்பகம், சென்னை - 600 014.

18. எ.ஃப். பாக்கியமேரி - வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு நியூசெஞ்சுரி புக் ஹவுஸ், சென்னை.

PART I - HINDI - COURSE PATTERN (2023 - 2026)

Part	Sem.	Code	Title of the Paper	Hours/ Week	Credit
I	I	23GH1GS01	Paper - I - Prose, Short Story and Grammar - I	5	3
	II	23GH2GS02	Novel, One act Play, and Grammar - II	5	3
	III	23GH3GS03	Poetry and History of Hindi Literature, Alankar	5	3
	IV	23GH4GS04	General Essay, Technical Hindi, Translation, and Letter Writing	5	3
		Total		**20**	**12**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate

TESTING AND EVALUATION

Course	Continuous Internal Assessment	Semester Examination
Hindi	25%	75%

Continuous Internal Assessment Component (CIA)

Component	Marks	Marks
Internal test I	40	Converted to 25
Internal test II	40	
Quiz	10	
Assignment	5	
Attendance	5	
Total	**100**	**25**

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA)

CIA components for Practical can be decided by the respective Departments.

Passing Minimum in the Continuous Internal Assessment is Compulsory for appearing the External Semester Examination

Passing Minimum for CIA Examination	
Theory	40% out of 25 Marks (i.e. 10 Marks)

PASSING MINIMUM FOR EXTERNAL SEMESTER EXAMINATION -UG

Semester Examination		
Theory	40% out of 75 Marks (i.e. 30 Marks)	40% out of 100 Marks (i.e. 40 Marks)
Practical	40% out of 60 Marks (i.e. 24 Marks)	

PAPER I - PROSE, SHORT STORY AND GRAMMAR - I

Semester: I **Hours: 5**

Code : 23GH1GS01 **Credits: 3**

1. Prose : Naveen Hindi Patamala Part-3

Published by Dakshina Bharathi Hindi Prachar Sabha,

Thyagaraya Nagar, Chennai - 600 017.

The following Lessons have been prescribed

a) Shiraj Ki Gurubhakthi

b) Shri Krishn

c) Gupth Rupya

d) Karmaveer Kamaraj

2. Short Story : Kahani Manjari

Edited by: Dakshin Bharath Hindi Prachar Sabha,

Thyagaraya Nagar, Chennai - 600 017.

The following short stories have been priscribed

a) Badegar kee beti	-	Premchand
b) Thayee	-	Vishwamranava Shrama Kaushik
c) Paanch minute	-	Mohanlalji Mahato yogi
d) Usne Kaha tha	-	Chandra dharshama Guleri

3. Grammar 1 : Vyakaran Pradeep Published by Ramdev, Hindi Bhaan,

63, Tagore Nagarm Allahabad -2

The following topics have been prescribed

a) Noun b) Gender and Number

c) Pronoun d) Adjectives

COMMUNICATIVE ENGLISH - I

Semester: I **Hours: 4**

Code : 23GE1GS01 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Discover a fair degree of competence in self-expression in both writing and speaking	PSO-5	K1
CO - 2	Comprehend by reading texts	PSO-2	K2
CO - 3	Articulate academic resources	PSO-4	K3
CO - 4	Focus on independent learning	PSO-3	K4
CO - 5	Estimate critical and analytical thinking	PO-1	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I				**COMMUNICATIVE ENGLISH -I**							**Hours: 4**
Code : 23GE1GS01											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	5	3	3	3	5	4	3	3	3	5	3.73
CO - 2	4	3	3	5	4	3	4	5	3	4	3	3.73
CO - 3	4	3	3	3	5	3	4	3	3	5	3	3.55
CO - 4	3	3	5	3	4	3	3	3	5	4	3	3.55
CO - 5	5	3	4	3	4	3	5	3	4	4	3	3.73
Overall Mean Score												**3.65**

Result: The score for this course is **3.65** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I **12 Hours**

1. Listening and Speaking
    a. Introducing self and others
    b. Listening for Information
    c. Pronunciation (without phonetic symbols)
        i. Essentials of pronunciation
        ii. American and British pronunciation
2. Reading and Writing
    a. Reading short articles - newspaper reports / fact based articles
        i. Skimming and scanning
        ii. Diction and tone
        iii. Identifying topic sentences
    b. Reading aloud: Reading an article/report
    c. Journal (Diary) Writing
3. Study Skills - I
    a. Using dictionaries, encyclopaedias, thesaurus

UNIT II **12 Hours**

1. Listening and Speaking
    a. Listening with a Purpose
    b. Effective Listening
    c. Tonal Variation
    d. Listening for specific information
    e. Asking for Information
    f. Giving Information
2. Reading and Writing
    a. Types of Reading: Extensive and Intensive Reading
    b. Reading a Prose Passage
    c. Reading a Poem
    d. Reading a Short Story
3. Paragraphs: Structure and types
    a. What is a Paragraph?
    b. Paragraph Structure
    c. Topic Structure
    d. Unity
    e. Coherence
    f. Connections between Ideas: Using Transitional words and expressions
    g. Types of Paragraphs

4. Study skills - II

   Using the internet as a resource

   a. Online search

   b. Know the keyword

   c. Refine your search

   d. Guidelines for using the Resources

   e. E- Learning resources of Government of India

   f. Terms to know

UNIT III **12 Hours**

1. Listening and Speaking

   a. Giving and following instructions

   b. Asking for and giving directions

   c. Continuing discussions with connecting ideas

2. Reading and writing

   a. Reading feature articles (from newspapers and magazines)
   b. Reading to identify point of view and perspective (opinion pieces, editorials etc.)
   c. Descriptive writing - writing a short descriptive essay of two to three paragraphs

UNIT IV **12 Hours**

1. Listening and Speaking

   a. Giving and responding to opinions

2. Reading and writing

   a. Note taking

   b. Narrative writing - writing narrative essays of two to three paragraphs

UNIT V **12 Hours**

1. Grammar in Context
   Naming and Describing
   a. Nouns and Pronouns
   b. Adjectives

Involving Action- I

   a. Verbs
   b. Concord

Involving Action- II

   a. Verbal- Gerund, Participle, Infinitive

   b. Modals

Tense

   a. Present

   b. Past

   c. Future

COURSE BOOKS:

- Communicative English (For Students of Arts and Science Colleges) Tamilnadu State Council for Higher Education (TANSCHE)
- Savarimuttu, Rohan J. S, and G. Petricia Alphine Nirmala, *English Grammar and Usage - An Ideal Companion for Advanced Learners*. New Century Book House (P) Ltd, 2016.

BOOKS FOR REFERENCE

1. Kumar, Manoj. *English Communication: Theory and Practice. Scholar* .Tech Press, 2018.
2. Nachmuthu, Cambridge. *Advanced Communication English.* Cambridge Publishers, 2011.

WEB SOURCES

1. https://www.youtube.com/watch?v=Y94s85-Crew
2. https://www.esolcourses.com/content/topicsmenu/listening.html
3. https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism?wssl=

OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++

Semester: I **Hours: 5**

Code : 23CA1MC01 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the fundamental Knowledge on C++ language and programming skill.	PSO-1	K1
CO-2	Understand the syntax, datatypes, Identifier and structure of C++ Programming	PSO-2	K2
CO-3	Apply the concepts of OOP and develop efficient C++ Programs	PSO-5	K3
CO-4	Analyze the types of Inheritance and OOP concepts using Classes and Objects	PSO-4	K4
CO-5	Evaluate the output of different concepts, files and exception handling mechanisms.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I				**OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++**								**Hours: 5**
Code : 23CA1MC01												**Credits: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	2	3	2	5	5	2	2	3	3	3.09
CO-2	4	3	5	3	5	2	4	5	3	3	3	3.64
CO-3	5	4	4	2	2	4	4	4	3	3	5	3.64
CO-4	3	5	3	3	2	4	3	4	4	5	3	3.55
CO-5	2	2	3	5	2	4	4	4	5	3	3	3.36
Overall Mean Score												**3.46**

Result: The score for this course is **3. 46** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Principles of Object-Oriented Programming: A look at Procedure Oriented-Programming - Object Oriented Programming Paradigm - Basic Concepts of Object- Oriented Programming - Benefits of OOP - Object Oriented Languages - Applications of OOP. **Beginning with C++:** Application of C++ - A Simple C++ Program - More C++ Statements - An Example with Class - Structure of C++ Program - Creating the Source File - Compiling and Linking. **Tokens, Expressions and Control Structures:** Tokens - Keywords - Identifiers and Constants - Basic Data Types- User Defined Data Types - Storage Classes - Derived Data Types - Symbolic Constants - Type Compatibility- Declaration of Variables - Dynamic Initialization of Variables - Reference Variables - Operators in C++ - Scope Resolution Operator - Member Dereferencing Operators - Memory Management Operators - Manipulators - Type Cast Operator - Expressions and Their Types - Special Assignment Expressions - Implicit Conversions - Operator Overloading - Operator Precedence - Control Structures. **(12 Hours)**

UNIT II

Functions in C++: Introduction- The **main**Function-Function Prototyping - Call by Reference - Return by Reference - Inline Functions- Default Arguments - Const Arguments - Recursion - Function Overloading - Friend & Virtual Function - Math Library Functions. **Classes and Objects:** Specifying a Class - Defining Member Functions -C++ Program with Class- Making an Outside Function Inline - Nesting of Member Functions - Private Member Functions - Arrays within a Class - Memory Allocation for Objects - Static Data Members - Static Member Functions - Arrays of Objects - Objects as Function Arguments - Friendly Functions - Returning Objects - Const Member Functions - Pointers to Members - Local Classes. **(12 Hours)**

UNIT III

Constructors and Destructors: Introduction - Constructors - Parameterized Constructors - Multiple Constructors in a Class - Constructors with Default Arguments - Dynamic Initialization of Objects - Copy Constructor - Dynamic Constructor - Constructing Two-Dimensional Arrays - Const Objects - Destructors. **Operator Overloading and Type Conversions**: Defining Operator Overloading - Overloading Unary & Binary Operators - Overloading Binary Operators using Friend - Manipulation of Strings using Operators - Rules for Overloading Operators - Type conversions. **Inheritance**: **Extending Classes:** Single Inheritance - Making a Private Member Inheritable - Multilevel Inheritance- Multiple Inheritance - Hierarchical Inheritance - Hybrid Inheritance - Virtual Base Classes - Abstract Classes - Constructors in Derived Classes - Member Classes - Nesting of Classes.

(12 Hours)

UNIT IV

Pointers Virtual Functions and Polymorphism: Introduction - Pointers -Pointers to Objects - this Pointer - Polymorphism - Pointers to Derived Classes - Virtual Functions - Pure Virtual Functions - Virtual Constructors and Destructors. **Managing Console I/O Operations:** C++ Streams - C++ Stream Classes - Unformatted I/O Operations - Formatted Console Operations - Managing Output with Manipulators. **Working with Files:** Classes for File Stream Operations - Opening and Closing a File - Detecting End-of-File - More about Open(): File Modes - File Pointers and their Manipulations - Sequential Input and Output Operations - Updating a File: Random Access - Error Handling During File Operations - Command Line Arguments. **(12 Hours)**

UNIT V

Templates: Introduction - Class Templates - Class Templates with Multiple Parameters - Function Templates - Function Templates with Multiple Parameters. Overloading of Template Functions - Member Function Templates - Non-Type Template Arguments. **Exception Handling:** Basics of Exception Handling - Exception Handling Mechanism - Throwing Mechanism - Catching Mechanism - Rethrowing an Exception - Specifying Exceptions - Exceptions in Constructors and Destructors - Exceptions in Operator Overloaded Functions. **Manipulating Strings:** Creating String Objects - Manipulating String Objects - Relational Operations - String Characteristics - Accessing Characters in Strings - Comparing and Swapping. **(12 Hours)**

BOOK FOR STUDY:

"Object Oriented Programming with C++", E. Balagurusamy, Tata Mc-GrawHill, 8th Edition, 2021.

UNIT I : Chapters: 1- 3
UNIT II : Chapters: 4, 5
UNIT III : Chapters: 6- 8
UNIT IV : Chapters: 9- 11
UNIT V : Chapters: 12, 13, 15

BOOKS FOR REFERENCE:

1. **"Object Oriented Programming in C++"**, Reema Thareja, 1st Edition, Oxford University Press 2022.
2. **"The Complete Reference C++",** Herbert Schildt, 4thEdition, Mcgraw Hill Education (India) , 2014.

C++ PROGRAMMING LAB

Semester: I **Hours: 5**

Code : 23CA1CP01 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the fundamental Knowledge of C++ language and programming skill.	PSO-1	K1
CO-2	Understand the syntax, datatypes, Identifier and structure of C++ Programming	PSO-2	K2
CO-3	Apply the concepts of OOP and develop efficient Programs	PSO-5	K3
CO-4	Analyze the types of Inheritance and OOP concepts using Classes and Objects	PSO-4	K4
CO-5	Evaluate the output of different concepts, files and exception handling mechanisms.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I			**C++ PROGRAMMING LAB**								**Hours: 5**
Code : 23CA1CP01											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	2	3	2	5	5	2	2	3	3	3.09
CO-2	4	3	5	3	5	2	4	5	3	3	3	3.64
CO-3	5	4	4	3	3	4	4	4	3	3	5	3.82
CO-4	3	5	3	3	2	4	3	4	4	5	3	3.55
CO-5	3	3	3	5	3	4	4	4	5	3	3	3.64
										Overall Mean Score		**3.55**

Result: The score for this course is **3.55** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

1. Write a Simple C++ program without Class
2. Write a C++ program to demonstrate Class and Objects
3. Write a C++ program to find the Biggest Number using Command Line Arguments
4. Write a C++ program to demonstrate the concept of Passing Objects to Functions
5. Write a C++ program to demonstrate function overloading
6. Write a C++ program to demonstrate Default Arguments and Inline function.
7. Write a C++ program to demonstrate the Friend Functions.
8. Write a C++ program to demonstrate Constructor and Destructor
9. Write a C++ program to demonstrate Unary Operator Overloading
10. Write a C++ program to demonstrate Binary Operator Overloading
11. Write a C++ program to demonstrate:
    a. Single Inheritance
    b. Multilevel Inheritance
    c. Multiple Inheritance
    d. Hierarchical Inheritance
    e. Hybrid Inheritance
12. Write a C++ program to demonstrate Virtual Functions.
13. Write a C++ program to manipulate a Text File.
14. Write a C++ program to perform Sequential I/O Operations on a file.
15. Write a C++ program to demonstrate Class Template
16. Write a C++ program to demonstrate Function Template.
17. Write a C++ program to demonstrate Exception Handling.

DISCRETE MATHEMATICS

Semester: I **Hours: 4**

Code : 23CA1AC1A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire a solid foundation in the principles of discrete mathematics, encompassing topics such as logic, set theory, combinatorics, and discrete structures	PSO-1	K1
CO-2	Understand the theoretical underpinnings of discrete mathematics	PSO-2	K2
CO-3	Develop problem-solving skills by applying discrete mathematical concepts to various scenarios	PSO-5	K3
CO-4	Analyze the efficiency and correctness of various theorems related to discrete mathematics	PSO-4	K4
CO-5	Synthesize information and evaluate the suitability of discrete models in solving real-world problems	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I							**DISCRETE MATHEMATICS**					**Hours: 4**
Code : 23CA1AC1A												**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	4	3	3	2	5	5	3	3	2	3	3.27
CO - 2	3	3	5	2	5	3	4	5	4	3	3	3.64
CO - 3	5	3	4	4	2	3	3	3	3	2	5	3.36
CO - 4	3	5	4	3	2	4	3	4	3	5	3	3.55
CO - 5	3	3	3	5	2	3	3	3	5	3	4	3.36
Overall Mean Score												**3.44**

Result: The score for this course is **3.44** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Set Theory: Introduction - Basic Concepts and Notations - Some More Definitions - Ordered Pairs and Cartesian Product - Set Operations - The Algebraic Laws of Set Theory - Dual Statement and Principle of Duality - Relations - Types of Relations - Some Operation of Relations - Composition of Relations - Properties of Relations - Equivalence Classes - Partition of a Set - Partitioning of a Set Induced by an Equivalence Relation - Matrix Representation of a Relation. **(12 hours)**

UNIT II

Function: Introduction - Representation of a Function - Types of Functions - Classification of Functions - Composition of Functions - Inverse of a Function - Binary and n-ary operation - Properties of Binary Operations - Some Special Functions.

(12 Hours)

UNIT III

Mathematical Logic: Introduction - Propositions - Connectives - Order of precedence for Logical Connectives - Conditional and Biconditional Propositions - Tautology and Contradiction - Equivalence of propositions - Duality Law - Duality Theorem - Algebra of Propositions - Tautological Implication - Normal Forms - Disjunction and Conjunctive Normal Forms - Principal Disjunctive and Principal Conjunctive normal Forms - Worked Examples 1(A) (1.1-13). **(12 Hours)**

UNIT IV

Combinatorics: Introduction - Permutations and Combinations - Pascal's Identity - Vandermonde's Identity - Permutations with Repetition - Circular Permutation - Pigeonhole principle - Generalization of the Pigeonhole Principle - Principle of Inclusion -Exclusion - Worked Examples 6(A) (6.1 - 6.30). **(12 Hours)**

UNIT V

Number Theory: Introduction - Divisibility - Prime Numbers - Fundamental Theorem of Arithmetic - The Sieve of Dratosthenes - Division Procedure - Greatest Common Decision - Alternative Definition of GCD (a,b) - Least Common Multiple - Congruence - Congruence Class Modulo m - Linear Congruence - The Chinese Remainder Theorem - Worked Examples. **(12 Hours)**

BOOK FOR STUDY:

- "**Discrete Mathematics with Graph Theory and Combinatorics**", T. Veerarajan, McGraw Hill Education (India) Private Limited, Chennai, 2018.

  Unit I : Chapter: 2(Pages 51 - 74)

  Unit II : Chapter: 4(Pages 182 -210)

  Unit III : Chapter:1(Pages 1-23)

  Unit IV : Chapter: 6(Pages 314-337)

  Unit V : Chapter: 3(Pages 156-180)

BOOKS FOR REFERENCE:

1. "**Discrete Mathematics and its Applications**", Kennenth Rosen, 7th Edition, McGraw Hill publication, 2017.
2. "**A Text Book of Discrete Mathematics**", Swapan Kumar Sarker, 9th edition, S.Chand Publication, 2016.

COMPUTER ORIENTED NUMERICAL METHODS

Semester: I **Hours: 4**

Code : 23CA1AC1B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Remember different methods to find numerical solution to ordinary differential equations	PSO-1	K1
CO-2	Understand simultaneous equations in various methods	PSO-2	K2
CO-3	Apply numerical methods to solve complex problems	PSO-5	K3
CO-4	Analyze the errors in numerical computation by solving problems	PSO-4	K4
CO-5	Evaluate and find the value of a function using Interpolation	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I				COMPUTER ORIENTED NUMERICAL METHODS								Hours:4
Code : 23CA1AC1B												Credit: 3
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO-1	3	4	3	3	2	5	5	3	3	2	3	3.27
CO-2	3	4	5	2	5	3	4	5	4	2	3	3.64
CO-3	5	3	4	4	2	3	3	3	3	2	5	3.36
CO-4	3	5	4	3	3	4	3	4	4	5	3	3.73
CO-4	3	3	3	5	2	4	3	3	5	3	4	3.45
Overall Mean Score												3.49

Result: The score for this course is **3.49** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Algebraic and Transcendental Equations: Introduction - Errors in Numerical Computation - Iteration Method - Bisection Method - Regular False Method -Newton-Raphson Method. **(12 Hours)**

UNIT II

Simultaneous Equations: Introduction - Simultaneous equations - Back Substitution - Gauss Elimination Method - Calculation of Inverse of a Matrix - Crout's Method. **(12 Hours)**

UNIT III

Interpolation: Introduction - Newton's Interpolation Formulae - Central Difference Interpolation Formulae (only first 3 methods) -Lagrange's Interpolation Formulae - Divided Differences - Newton's Divided Differences Formulae - Inverse Interpolation. **(12 Hours)**

UNIT IV

Numerical Differentiation and Integration: Introduction - Derivatives usingNewton's Forward Differences Formula - Derivatives using Newton's BackwardDifference Formula - Derivatives using Central Difference Formulae - Maxima andMinima of the Interpolating Polynomial - Numerical Integration - Newton-Cote'sQuadrature formula - Trapezoidal Rule - Simpson's one third Rule - Simpson'sthree eight Rule. **(12 Hours)**

UNIT V

Numerical solution of Ordinary Differential Equations: Introduction - Taylor'sseries method - Picard's method - Euler's method - Runge-Kutta method. **(12 Hours)**

BOOK FOR STUDY:

- "**Numerical Methods**" S. Arumugam, S.ThangapandiIssac and. A. Soma Sundaram, Second edition, Sci Tech Publication (India) Pvt. Ltd, Chennai, 2017.

  Unit I : Chapter: 3 (3.1 - 3.4) (sums only)
  Unit II : Chapter: 4 (4.1 - 4.6) (sums only)
  Unit III : Chapter: 7 (7.1 - 7.6) (sums only)
  Unit IV : Chapter: 8 (8.1 - 8.5) (sums only)
  Unit V : Chapter: 10 (10.1 - 10.4) (sums only)

BOOKS FOR RESERENCE:

1. "**Numerical Methods in engineering & Computer Science**", Dr. B.S. Grewal, Khanna publishers, Seventh Edition, July 2005.
2. "**Numerical Methods**", Dr. A. Singaravelu, Meenakshi Agency, New RevisedEdition, 2009.

OFFICE AUTOMATION LAB

Semester: I **Hours: 2**
Code : 23CA1AP01 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire knowledge on editor, spread sheet, slide preparation	PSO-1	K1
CO-2	Understand the fundamental concepts of office automation tools	PSO-4	K2
CO-3	Apply the different formatting styles in editor, spread sheet, slide preparation	PSO-5	K3
CO-4	Analyze the result of various formulas in office automation software	PSO-2	K4
CO-5	Evaluate different types of Charts for the given data	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I							**OFFICE AUTOMATIONLAB**					**Hours: 2**
Code : 23CA1AP01												**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	4	3	2	5	5	4	3	3	3	3.55
CO-2	3	5	4	3	2	3	4	3	3	5	3	3.45
CO-3	5	3	3	4	2	4	3	3	3	3	5	3.45
CO-4	3	3	5	3	5	2	3	5	3	4	4	3.64
CO-5	3	3	4	5	2	4	3	3	5	4	3	3.55
Overall Mean Score												**3.53**

Result: The score for this course is **3.53** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

MS-WORD

1. Type two paragraphs in word and apply all types of formatting to the text.
2. Type the courses offered by your college using bullets and numbering
3. Create table with different designs and colors and use formula for calculation.
4. Create an advertisement using drawing tools, Shapes, images and Watermark options.
5. Prepare your resume and apply mail merge.
6. Use comments and hyperlinks in document.
7. Create Chart and Smart Arts in Word

MS-EXCEL

8. Create an excel worksheet for arithmetic operations.
9. Create an Excel worksheet for Marksheet processing. Use formula to calculate total, average and result.
10. Demonstrate Statistical functions in Excel.
11. Create a worksheet to illustrate sorting
12. Create different charts in Excel.

MS-POWERPOINT

13. Create five slides using drawing tools and pictures.
14. Create a PPT with different text effects and slide transitions
15. Create a PPT with sound effects and animations.
16. Create a PPT for Computer Fundamental Quiz
17. Create a Slide Show about your College

PROFESSIONAL ENGLISH

Semester: I **Hours: 2**

Code : 23AE1PE01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recognise their own ability to improve their competence in using the language	PSO-1	K1
CO - 2	Relate to the language with confidence, ensuring communication is intelligible	PSO-2	K2
CO - 3	Employ unfamiliar vocabularies in their context	PSO-3	K3
CO - 4	Correlate their professional communication skills	PSO-4	K4
CO - 5	Assess the errors while framing sentences	PSO-5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I				**PROFESSIONAL ENGLISH**							**Hours: 2**
Code : 23AE1PE01											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	4	3	4	3	4	5	4	3	3	4	3.82
CO - 2	3	4	3	5	3	4	3	5	3	3	4	3.64
CO - 3	4	3	5	4	4	3	4	4	5	4	3	3.91
CO - 4	4	3	3	4	5	3	4	4	3	5	3	3.73
CO - 5	3	5	3	3	3	5	3	3	3	3	5	3.55
Overall Mean Score												**3.73**

Result: The score for this course is **3.73** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I: THE ART OF QUESTIONING **6 Hours**

The Art of Questioning Paper-1 (Chamber 1-Orator: Units 1-5)

The Art of Questioning Paper-2 (Chamber 1-Orator: Units 1-3)

UNIT II: RECEPTIVE RESPONSE **6 Hours**

Receptive Response Paper-1 (Chamber 2 - Orator: Units 1-3)

Receptive Response Paper-2 (Chamber 2 - Orator: Units 1-4)

UNIT III: EASY EXPRESSIONS **6 Hours**

Easy Expressions Paper-1 (Chamber 2 - Orator: Units 1-4)

Easy Expressions Paper-2 (Chamber 2 - Orator: Units 1-3)

UNIT IV: EVERY DAY ENGLISH **6 Hours**

Every Day English Paper-1 (Chamber 3 - Orator: Units 1-5)

Every Day English Paper-2 (Chamber 3 - Orator: Units 1-3)

UNIT V: TELEPHONE SKILLS **6 Hours**

Buzz-Telephone skills - Basic (Chamber 6 - Kaleidoscope)

Buzz-Telephone skills - Customer support: Topics 1-5 (Chamber 6 - Kaleidoscope)

Buzz-Telephone skills - Front Office (Chamber 6 - Kaleidoscope)

COURSE SOFTWARE:

Lady Hawk Software

Component	Marks
Internal test I	40
Internal test II	40
Dialogue/ Conversation	10
Expressions Using Chart	5
Attendance	5
Total	**100**

COMPUTER FUNDAMENTALS

Semester: I **Hours: 2**

Code : 23CA1FC01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge on the fundamentals of Computers and the Input and Output devices	PSO -1	K1
CO - 2	Understand the logic gates and their working principles.	PSO - 4	K2
CO - 3	Apply the knowledge to solve Boolean Expressions	PSO - 5	K3
CO - 4	Analyze number systems and the number conversion methods	PSO - 2	K4
CO - 5	Evaluate Data Storage systems and the features of RAM and ROM in Computers	PSO - 3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I			**COMPUTER FUNDAMENTALS**						**Hours: 2**		
Code : 23CA1FC01									**Credit: 2**		
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	3	4	2	5	5	3	3	4	3	3.64
CO - 2	4	3	5	3	5	4	4	5	3	4	3	3.91
CO - 3	5	4	3	4	2	3	3	3	3	2	5	3.36
CO - 4	3	5	4	3	2	4	3	3	4	5	3	3.55
CO - 5	3	3	4	5	2	3	3	3	5	3	3	3.36
Overall Mean Score												**3.56**

Result: The Score for this Course is: **3.56** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Computer Basics: Algorithms- Simple Model of a Computer- Characteristics of Computers - Problem Solving Using Computers. **Data Representation:** Representation of Characters in Computers - Representation of Integers- Representation of Fractions -Hexadecimal Representation of Numbers - Decimal to Binary Conversion - Error Detecting Codes. **(6 Hours)**

UNIT II

Input/Output Units: Traditional Computer Input/Output Units - Other Input Technologies - Computer Output Devices - Choosing a Printer. **(6 Hours)**

UNIT III

Computer Memory: Memory Cell - Memory Organization- Read Only Memory - Serial Access Memory- Physical Devices Used to Construct Memories -Magnetic Hard Disk - Compact Disk Read Only Memory (CDROM) - Magnetic Tape Drive - Memory Hierarchy. **(6 Hours)**

UNIT IV

Binary Arithmetic: Binary Addition- Binary Subtraction- Signed Numbers - Two's Complement Representation of Numbers- Addition/Subtraction of Numbers in 2's Complement Notation - Binary Multiplication- Binary Division- Arithmetic Operations with Normalized Floating Point Numbers. **(6 Hours)**

UNIT V

Logic Circuits: Introduction -Switching Circuits - AND/OR Operations - NOT Operation Boolean Functions - Postulates - Duality Principle - Theorems - Precedence of Operators -Venn Diagram - Truth Table - Canonical Forms for Boolean Functions - Logic Circuits - Parallel and Serial Adders - Physical Devices Used to Construct Gates - Transistors - Integrated Circuits. **(6 Hours)**

BOOK FOR STUDY:

1. **"Fundamentals of Computers"**, V. Rajaraman, Neeharika Adabala, PHI Learning Private Limited, 6th Edition, 2015.

Unit I	**:** Chapters: 1, 2
Unit II	**:** Chapters: 3
Unit III	**:** Chapters: 4
Unit IV	**:** Chapters: 6
Unit V	**:** Chapter: 7

BOOKS FORREFERENCE:

1. **"Digital Computer Fundamentals"**, Thomas C. Bartee, 6th Edition, 2005.
2. **"Digital Fundamentals",** Thomas L. Floyd, 11th Edition, Global Edition, Pearson Education Limited 2015.

PART - V - STUDENT TRAINING PROGRAMME

NATIONAL SERVICE SCHEME

U. G. PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAM THE STUDENTS WILL BE ABLE TO
1.	Gain theoretical knowledge and apply the expertise in different fields.
2.	Acquire Industry specific skills and can emerge as entrepreneurs.
3.	Develop critical and rational thinking to solve societal issues.
4.	Explore the knowledge and acclimatize it in the ever changing work environment.
5.	Evolve theories and develop innovative discipline specific ideas.
6.	Comprehend the nuances and develop innovative, discipline-specific ideas.

U. G. PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THE PROGRAM THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO-1	Get knowledge about National Service Scheme.	PO-1
PSO-2	Acquire leadership skills and readiness to serve the society.	PO -2
PSO-3	Enhance perspectives of social issues in different point of views Think and act effectively in a critical situation.	PO-3
PSO-4	Develop positive attitude towards betterment of the society through voluntary service.	PO-4
PSO-5	Preserve nature, ethos and traditions and practices of the society.	PO-1

NATIONAL SERVICE SCHEME

Semester: I -IV **Hours: 2**

Code : 23STPNS01 **Credit: 1***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the basic knowledge about NSS	PSO-1	K1
CO - 2	Uphold the value system based on the social, political and moral bases	PSO-1, PSO-2	K2
CO - 3	Understand and identify the needs of the society	PSO-1, PSO-2, PSO - 4	K3
CO - 4	Develop the capacity to meet emergencies and attain knowledge to concentrate on personal health and hygiene	PSO2-, PSO-4 PSO-5	K4
CO - 5	Face the challenges particularly to become women entrepreneurs	PSO-1	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I -IV				**NATIONAL SERVICE SCHEME**							**Hours: 2**
Code : 23STPNS01											**Credit: 1***
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	**1**	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	3.81
CO - 2	4	5	4	3	4	3	4	3	4	4	4	3.90
CO - 3	5	4	4	4	4	4	4	3	4	4	3	3.90
CO - 4	4	4	5	3	4	4	5	4	3	3	4	4.00
CO - 5	5	4	4	3	4	4	4	5	4	3	4	3.90
Overall Mean Score												**3.90**

Result: The score for this course is **3.90** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I: BASICS OF NSS

Introduction –History and Growth – Aim and Objectives – NSS Motto – NSS Symbol - NSS Badge – NSS Day - Code of Conduct- NSS Regular Activities & Special Camp.

UNIT II: PERSONALITY DEVELOPMENT

Personality Development – Know Thyself- Body Language- Forming Values Etiquette and Manner - Team Building and Team Work – Problems of Youth – Drug abuse - Drug Dependence /Addiction –Alcoholism – Suicide - Sexual Problems – Diseases.

UNIT III: SOCIAL SERVICE

Aim of Social Service – Social Service Organizations - Social Problems - Need for Social Service - Scope of Social Services - Functions of Social Services - Principles of First Aid - Important things kept in the First Aid Box - Snake Bite - Dog Bite - Insect Bite - Heat Stroke - Drowning - Electric Shock - Artificial Respiration – Hemorrhage – Stroke - Heart Attack – Symptoms – Fainting.

UNIT IV: NUTRITIOUS FOOD AND WOMEN'S HEALTH

Nutrition - Adequacy – Balance - Calorie Management - Dietary Density – Moderation – Variety - Calculation of Calorie Permittance - Calculation of Protein Percentages - Food Sources - Vitamins the Importance of Dietary Nutrition Women's Health

UNIT V: ECOLOGY AND ROLE OF WOMEN IN SOCIETY

Environment - Environmental Elements - Environmental concerns - Changing Climate – Global warming – Women achievers - Women's Place in Society - Social Issues against Women - The Ways to Empower Women.

COURSE BOOK:

- Arul Sunila.J, Flora Pauline Mary.V, Preethi.J, Padmasree. A. D, Girija Bai. T, Arul Irudaya Jeyanthi.J, Abinaya. D, *NOT ME BUT YOU*, Acca Printing Press, 2022

Components	Marks
Attendance	20
Assessment (Involvement in activities)	50
Test	30
Total	**100**

QUESTION PATTERN

NATIONAL SERVICE SCHEME-23STPNS01

Class: II UG **Time: 2 Hours**

Date: **Max.: 30 Marks**

Course Outcome	**Bloom's K-level**	**Q. No**	SECTION – A 2x5=10 Answer All Questions Internal choice
			SECTION – B 2x10=20 Answer any TWO of the following

NATIONAL CADET CORPS

U.G. PROGRAMME OUTCOMES (2023 - 2026)

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Think critically, evaluate analytically and apply the expertise of their discipline in related scenario.
2.	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
3.	Accomplish the basic understanding of the relationship between education and human life and enhance their perspectives on the various functions of their studies in the diverse contexts of the society.
4.	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities.
5.	Develop skills like collaboration, higher-order thinking, problem solving and self-direction through effective use of technologies and resources.
6.	Increase self-awareness, set and pursue meaningful goals, and develop positive personal qualities such as self-esteem, positive attitude, self-discipline, and self-motivation.

PROGRAM SPECIFIC OUTCOMES (PSO)

PSO NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1	Reinforce the aims, motto, vision and mission of the NCC through the academic curriculum.	PO-1, PO-3
2	Train the students, to be graduates with all round development, who apart from their own subject, can successfully compete in other fields such as defense/paramilitary/ police forces and civil services.	PO-1, PO-4
3	Perform in social service activities and creating awareness about social evils in society.	PO-1, PO-5, PO-6.
4	Explain the tri services organization, comprising the army, navy and air force, engaged in grooming the youth of the country into disciplined and patriotic citizens.	PO-2, PO-6
5	Demonstrate "B" and "C" certificate examination of NCC helps in getting jobs in different forces and also security related jobs.	PO-1, PO-2, PO-5,PO-5, PO-6

NATIONAL CADET CORPS

Semester: I - IV **Hours: 240**

Code : 23STPNC01 **Credits: 1***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the history, honors and awards of Indian Military.	PSO - 1,PSO - 2, PSO - 4	K1
CO - 2	Explain the map and weapon training to remove the fear of a weapon from the hearts of youth.	PSO - 1, PSO - 4	K2
CO - 3	Illustrate the different types of disasters under different circumstances.	PSO - 2,PSO - 3, PSO 4, PSO - 5	K3
CO - 4	Analyze the practical knowledge in community development and other social programs.	PSO - 4, PSO - 5	K4
CO - 5	Assess the personality development and develop technical skill of first Aid.	PSO - 1, PSO - 2	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I - IV			**NATIONAL CADET CORPS**						**Hours: 240**
Code : 23STPNC01									**Credits: 1***
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**			**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	3	3	4	3	4	4	3	3	3	3.4
CO - 2	3	4	3	3	4	3	4	4	3	4	4	3.54
CO - 3	3	3	4	4	4	4	3	4	4	3	5	3.72
CO - 4	3	3	4	5	4	4	3	3	4	5	4	3.81
CO - 5	3	3	5	4	3	4	3	3	4	5	4	3.72
Overall Mean Score												**3.64**

Result: The score for this course is **3.64** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

UNIT I: ARMED FORCES AND MILITARY HISTORY

Army, Police and Central Armed Police Forces, Modes of Entry into Army, Police and CAPF, Aims and Objectives of NCC , Organisation, Training and NCC Song , Incentives , Honors and Awards, Biographies of Renowned Generals, War Heroes : Param Veer Chakra Awardees, Study of Battles of Indo-Pak Wars 1965, 1971, & Kargil, War Movies, "B" and "C" certificate examinations.

UNIT II: MAP READING, FCBC AND WEAPON TRAINING

Introduction to Map Reading, Conduct of Map Reading, Introduction to Field Craft and Battle Craft, Indication of landmark, Observation, Camouflage & Concealment, Fire and Move Capsule, Knots, Lashing and Strecthers, Organisation of Infantry Battalion & its weapons. Characterstics of a Rifle and its Ammunition, Stripping, Assembling, Care, and Cleaning of 7.62 SLR, Loading, Cocking and Unloading, Lying Position, Holding and Aiming, Trigger Control and Firing a Shot, Theory of Group and Snap Shooting, Obstacle Training

UNIT III: DISASTER MANAGEMENT AND CIVIL AFFAIRS

Civil Defence Organisation and NDMA, Types of Emergencies / Natural Disasters, Fire Services & Fire Fighting, Traffic Control During Disaster Under Police Supervision, Collection & Distribution of Aid Material, Essential Services and their Maintenance. Aim of aid to civil authority - Role of NCC Cadets during natural calamities - Types of disaster- Essential services during natural calamities

UNIT IV: NATIONAL INTEGRATION AND SOCIAL AWARENESS

Basics of Social Service and Its Need, NGOs Role & Contribution, Drug Abuse and Trafficking, Causes & Prevention of HIV / AIDS and Role of Youth, Counter Terrorism, Traffic Control Organisation and Anti Drunken Driving, Religions, Culture, Traditions and Customs of India. National Interests, Objectives, Threats and Opportunities. Unity in Diversity. National Integration Council. Contribution of Youth in Nation Building. Leaders of Political / Regional Parties, Media Persons, Women Representatives, Eminent Public Representatives, Representatives of Business

UNIT V: PERSONALITY DEVELOPMENT, LEADERSHIP AND FIRST AID

Factors Influencing and Shaping Personality : Physical, Social, Psycological and Philosophical Types of Leadership, Time Management, Stress Management Skills, Interview Skills, Sociability : Social Skills Ettiquettes And Mannerism, Injuries to Internal Organs, Burns and Scalds, Snake Bite, Scorpion Bite & Rabid Dog Bite, Foreign Bodies in Eye, Ear and Nose, Insensibility or Unconsciousness, Artificial Respiration.

BOOK FOR REERENCE:

- Mishra R.C., A Handbook of NCC, Kanti Prakashan, Etawah, 2000.

Scheme of Evaluation	
Summative Examination (2 hours)	25 Marks
Continuous Internal Assessment	75 Marks
Total	**100 Marks**

Scheme of Evaluation of Continuous Internal Assessment		
1.	Attendance - 240 hours	10 Marks
2.	Special Camp	40 Marks
3.	"B" and "C" certificate examination	25 Marks
Total		**75 Marks**

Question Pattern for Summative Examination

Total Marks: 25 **Time: 2 hours**

Section - A

Answer All Questions 5× 1= 5Marks
(Multiple Choice Questions)

Section - B

Answer All Questions 2 × 5=10 Marks
(Either or Questions)

Section - C

Answer any one Questions 1 × 10=10 Marks
(One Question Out of Two)

PHYSICAL EDUCATION (2023-2026)

Code	Year	Paper Title	Hours	Credit
23STPPE01	I & II	Yoga and Physical Wellness	120	1*

YOGA AND PHYSICAL WELLNESS

Semester: I to IV **Hours: 120**

Code : 23STPPE01

COURSE OUTCOMES

- To develop Physical and mental fitness.
- To motivate and encourage students to involve themselves in physical skills through the Sports and Games and Yoga.
- To promote harmonious all-round development of the students

UNIT I: ASANAS (24 hours)

Meaning - Benefits - Postures: Sitting - Standing - Prone - Supine.

UNIT II: PRANAYAMA (24 hours)

Meaning - Benefits - Steps in Pranayama: Puraka, Khumbaka, Rechaka - Mudras: Chin mudra, Chinmaya mudra, Brahma mudra.

UNIT III: SURYANAMASKAR (24 hours)

Meaning - Benefits - Steps - Poses (12 posture)

UNIT IV: NUTRITION (24 hours)

Meaning - Balanced Diet - Daily Energy Requirement - Nutrient Balance - Nutrition Intake - Body Mass Index

UNIT V: FIRST AID (24 hours)

Meaning - Injuries to bones and Muscles, Sprain, Strain, Muscle Cramp and joints Dislocation and Fractures - Snake-bite, Dog bite

BOOKS FOR REFERENCE:

1. Elangovan.R, (2002), 'Utarkalvi Oru Arimugam', Ashwin Publication, Triunelveli.
2. Chandrasekaran.K, (1999), 'Sound Health through Yoga, Prem Kalyan Publication, Sedapatti.
3. John Ambulance Association, 'First Aid to the Injured' New Delhi
4. Prabhakar Eric, (1995), 'The way to Atheletic Gold', Affliated East West Pvt. Ltd., New Delhi.
5. Sathyanesan, R.C., 'Hand Broken Physical Education', Gheena Publishers, Madurai

SCHEME OF EVALUATION

1.	Summative Examination (2 hours)	:	25 marks
2.	Continuous Internal Assessment	:	75 marks
	Total	**:**	**100 marks**

SCHEME OF EVALUATION FOR COTINUOUS INTERNAL ASSESSMENT

1.	Attendance (240 hrs)			:	20 marks
	❖ Theory Class	:	120 hrs		
	❖ Games	:	60 hrs		
	❖ Field Work	:	60 hrs		
2.	Performance in any one Game			:	10 marks
3.	Performance in any one of Athletic event			:	10 marks
4.	Performance in Yoga / Rhythmic activities			:	10 marks
5.	Rhythmic activities				10 marks
6.	Field Work			:	15 marks
	Total			**:**	**75 marks**

QUESTION PATTERN FOR SUMMATIVE EXAMINATION

Total marks: 25 **Time: 1 $^{1/2}$ hours**

SECTION - A

Answer All Questions (5x1=5)

(Choose the best Answer)

SECTION - B

Answer any two questions (2x2=4)

(Four question out of four)

SECTION - C

Answer any Two out of Four questions (2x5=10)

(Four question out of Four)

SECTION - D

Answer any one question (1x6=6)

(One question out of two)

CONSUMER CLUB

PROGRAMME OUTCOMES:

PO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO
1.	Think critically, evaluate analytically and apply the acquired knowledge of their discipline in related scenario
2.	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
3.	Express the cultural and environmental diversity that they have been exposed in various studies
4.	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities
5.	Develop higher-order thinking, problem solving and self-direction skills through effective use of technologies and other resources
6.	Increase self-awarness, set and pursue meaningful goals, and develop positive personal qualities

PROGRAMME SPECIFIC OUTCOMES:

PSO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO-1	Aware of consumer's rights, responsibilities and consumer production Act,1986	PO-1
PSO-2	Instill right-consciousness, confidence to question violations of citizen and consumer rights and fight for justice	PO-1, PO-4, PO-6
PSO-3	Work with other voluntary consumer organizations to enhance consumer movement in the society	PO-3, PO-6
PSO-4	Make informed purchase decision as individual and inculcating the behavior in others also	PO-3, PO-4, PO-6
PSO-5	Gain practical knowledge and become good consumer as well as entrepreneur	PO-4, PO-5, PO-6

CONSUMER CLUB

Semester: I-IV **Hours: 120**

Code : 23STPCC01 **Credit: 1***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of aware of the nature, rights and responsibilities of consumer	PSO - 1	K1
CO - 2	Understand the concepts of food trade and certification	PSO - 4	K2
CO - 3	Identify misleading advertisement, consumer court and consumer redressal	PSO - 3,5	K3
CO - 4	Analyze the concept of food adulteration and ecofriendly products	PSO - 2	K4
CO - 5	Evaluate practical experience through field visit and interact with experts	PSO - 2	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I-IV				**CONSUMER CLUB**							**Hours: 120**
Code : 23STPCC01											**Credit: 1***
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	3	4	3	3	3	3	4	3	4	3.45
CO - 2	3	3	4	3	4	3	4	4	3	4	3	3.45
CO - 3	4	4	3	4	3	4	3	3	4	3	4	3.54
CO - 4	3	3	4	3	4	3	4	4	3	4	3	3.45
CO - 5	4	3	4	3	4	3	4	3	4	3	4	3.54
Overall Mean Score												**3.48**

Result: The score for this course is **3.48** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Basics of Consumer: Consumer - Meaning - Difference between Consumer and Buyer - Consumerism - Nature of Consumerism - Roots of Consumerism - Rights and Responsibilities of Consumer- Consumer Protection - Rights of Consumer under Consumer Protection Act 1986- Do's and Don'ts of consumer.

UNIT II

Trade Mark & Certification: Definition - Objectives - Types of Trademark - Categories of Trademark-Registrar of Trademark - Powers and functions of Registrar of Trademark - Certification: Certification Marks issued for different products in India - Types of certifications.

UNIT III

Advertisement & Food Adulteration: Definition - Features of Advertisement - Misleading Advertisement - Online Consumer - Rights of online consumer - Food Adulteration**: Introduction - Types of Food Adulteration - Causes of Food Adulteration - Methods of Food Adulteration - Food Adulteration in Developing Countries - Health Hazards of Food Adulteration - Mitigation Measures for Addressing Food Adulteration** - How can Adulteration to be prevented - Food Contamination.

UNIT IV

Eco-Friendly Consumer, Consumer Redressal & Grievance: Eco-Friendly consumer Products - Eco-friendly products for daily life - Innovative and Eco-friendly Business ideas - Green Consumerism - Important steps of Green Consumerism - Green marketing strategies- Consumer Court - Objectives - Consumer Disputes Redressal Agencies - Model Form of Complaints - How to file a Complaint in Consumer Court - Grievance -Features of Grievance - Causes of Grievance - Where to file a Complaint-Redressal settlement machinery.

UNIT V

Field Visit.

COURSE BOOKS:

- Material prepared by the Consumer Club

BOOK FOR REFERENCE:

1. Dr. L. Natarajan, Business Legislation, Merit India Publication, 2017.
2. Consumer Movement, Robert N. Mayer, Twayne Publishers Inc., U.S.,1989
3. Consumer Education and Economics, Charles A. Malouf, 2002

E-RESOURCES:

1. https://www.Consumer-Awareness-Protection-Empirical-Evidence/dp/1723301108
2. https://www.himpub.com/documents/Chapter1482.pdf
3. https://www.Consumer-Education-Veena-Gandotra/dp/9382007008

SCHEME OF EVALUATION

1.	Summative Examination (1 hour)	:	25 marks
2.	Continuous Internal Assessment	:	75 marks
	Total	**:**	**100 marks**

Scheme of Evaluation of Continuous Internal Assessment		
1.	Field Visit	25 Marks
2.	Report	25 Marks
3.	Involvement	10 Marks
4.	Case Study	10 Marks
5.	Attendance	5 Marks
Total		**75 Marks**

Total the marks of I, II, III & IV will be converted to 75 marks

INTERNAL TEST (THEORY)

Total Marks: 25 **Time: 1 Hour**

Section - A

Answer All Questions 5 x 1= 5 Marks
(Multiple Choice Questions)

Section - B

Answer All Questions 2 x 5= 10 Marks
(Either Or Questions)

Section - C

Answer Any One Question 1 x 10 =10 Marks
(One Question Out of Three)

RED RIBBON CLUB

PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO
1.	Think critically, evaluate analytically and apply the acquired knowledge of their discipline in related scenario
2.	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
3.	Demonstrate the precise understanding of the principles and theories of their discipline through experiments.
4.	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities
5.	Develop higher-order thinking, problem solving and self-direction skills through effective use of technologies and other resources
6.	Increase self-awareness, set and pursue meaningful goals, and develop positive personal qualities

PROGRAMME SPECIFIC OUTCOMES:

PSO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO-1	Tell the importance of Red Ribbon Club for the Society.	PO-1, PO-6
PSO-2	Explain the structure of Blood and its Uses.	PO-3, PO-4
PSO-3	Demonstrate the microscopic examination of Blood Identification and Donation process.	PO-3, PO-5
PSO-4	Classify the Blood types, Donation process and HIV Awareness.	PO-2, PO-4
PSO-5	Estimate the vision of Red Ribbon Club and its role in the society.	PO-5, PO-6

RED RIBBON CLUB

Semester: I, II, III & IV **Hours: 120**

Code: 23STPRR01 **Credit: 1***

COURSE OUTCOMES

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the meaning and basic concepts of Red Ribbon Club	PSO -1, PSO-5	K1
CO - 2	Classify the services rendered by Red Ribbon Club	PSO -1, PSO -4	K2
CO - 3	Relate the vision and objectives of Red Ribbon Club with its services	PSO- 1, PSO-3	K3
CO - 4	Categorize the objectives, Blood identification and HIV Testing process	PSO -4, PSO-5	K4
CO - 5	Evaluate the awareness programmes against the communicable diseases	PSO -2, PSO-5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I, II, III & IV				RED RIBBON CLUB							Hours: 120
Code : 23STPRR01											Credit: 1*
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	3	2	3	4	5	5	3	4	2	5	3.27
CO - 2	4	5	3	5	2	4	5	4	2	5	3	3.54
CO - 3	5	3	4	3	4	5	5	3	5	4	2	3.72
CO - 4	2	5	5	3	4	4	4	2	3	5	5	3.36
CO - 5	3	4	2	5	5	4	3	5	2	3	5	3.27
Overall Mean Score												**3.43**

Result: The score for this course is **3.43** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Red Ribbon Club-Basic Concepts - Meaning -Vision - Objectives - Popular Colour - Symbol - Significance

UNIT II

Blood Identification - Blood composition - Blood types -Functions of Blood - Components of Blood Plasma -Blood Vessels - Microscopic examination -DNA analysis

UNIT III

Blood Donation - Procedure -Importance of Donating Blood -Steps taken to ensure the safety of transfused blood - Benefits - Donors - Blood Banks - Outdoor camps - Storage, Supply & Demand

UNIT IV

HIV Awareness**:** Definition -Signs &Symptoms - HIV Transmission-Risk factors-Diagnosis & Tests-Treatment methods - Prevention -Tamil Nadu AIDS Control Society (TANSACS) - Components

UNIT V

Blood Donation Camp - Practical and Field Work : Blood Identification Camp - HIV AIDS Awareness Programmes - Field visit to JeevanJothi - Aundipatti Government Hospital

COURSE BOOK:

- Book offered by Red Ribbon Club Committee Members

BOOKS FOR REFERENCE

1. Conor S, Kingman S. *The search for the virus, the scientific discovery of AIDS and the quest for a cure,*Penguin Books, 1988.
2. S. Kartikeyan, R.N. Bharmal, R.P. Tiwari and P.S. Bisen.*HIV and AIDS: Basic Elements and Priorities*. Springer Publications. 2007.
3. Narain, Jai P; AIDS in Asia: The Challenge Ahead, Sage Publications, New Delhi, 2004
4. Nath, LM; The Epidemic in India: An Overview, Mosaic Books, New Delhi, 2003.
5. Srivastava V.P., HIV/AIDS and Human Rights, Indian Publishers, Delhi, 2006.
6. Shalini Bharat, HIV/AIDS related Stigma, Discrimination and Denial, Best Practices, Key Material. UNAIDS Publications, 2001

SCHEME OF EVALUATION

1.	Summative Examination (1 hour)	:	25 marks
2.	Continuous Internal Assessment	:	75 marks
	Total	**:**	**100 marks**

Scheme of Evaluation of Continuous Internal Assessment		
1.	Field Visit	25 Marks
2.	Report	25 Marks
3.	Involvement	10 Marks
4.	Case Study	10 Marks
5.	Attendance	5 Marks
Total		***75 Marks***

Total the marks of I, II, III & IV will be converted to 75 marks

Question Pattern for Internal Examination

Total Marks:25 **Time : 1hour**

Section - A

Answer All Questions 5 x 1= 5 Marks

(Multiple Choice Questions)

Section - B

Answer All Questions 2 x 5= 10 Marks

(Either or Questions)

Section - C

Answer Any One Question 1 x 10 =10 Marks

(One Question Out of Three)

YOUTH RED CROSS

Semester: I-IV **Hours: 120**

Code : 23STPRC01 **Credit: 1***

PROGRAMME OUTCOMES:

PO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO
1.	Think critically, evaluate analytically and apply the acquired knowledge of their discipline in related scenario.
2.	Formulate hypothesis, design experiments use appropriate tools and interpret the results.
3.	Demonstrate the precise understanding of the principles and theories of their discipline through experiments.
4.	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
5.	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities
6.	Increase self-awarness, set and pursue meaningful goals, and develop positive personal qualities.

PROGRAMME SPECIFIC OUTCOMES

PSO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO1	Get a basic understanding of the origin, growth and development of humanity.	PO1
PSO2	Acquire basic knowledge about social subjects	PO1, PO2
PSO3	Identify various social issues and problems	PO3, PO4
PSO4	Help build up a good career	PO1, PO4
PSO5	Gain awareness of social responsibilities	PO1, PO5

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand themselves in relation to their community	PSO- 1	K1
CO - 2	Identify the needs and problems of the community and involve them in problem solving.	PSO-2	K2
CO - 3	Gain skills in mobilizing community participation. Develop capacity to meet emergencies and social harmony	PSO-3	K3
CO - 4	Educate and empower children and youth in the spirit of the Red Cross through constructive trainings and effective leadership	PSO-4	K4
CO - 5	Provide opportunities for directing and harnessing their energies and idealism into worthwhile humanitarian activities	PSO-5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: I-IV							YOUTH RED CROSS					Hours: 120
Code : 23STPRC01												Credit: 1*
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	5	4	3	2	2	5	5	3	2	2	3.45
CO - 2	5	5	4	3	2	2	5	5	4	2	2	3.55
CO - 3	5	4	4	3	4	2	5	5	5	2	3	3.91
CO - 4	5	4	5	4	3	3	5	5	5	2	3	4.09
CO - 5	5	4	5	3	3	3	5	5	5	2	3	4.09
Overall Mean Score												3.82

Result: The score for this course is **3.82** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

BASICS OF YOUTH RED CROSS

Semester: I & II **Hours: 60**

Code: 23STPRC01 **Credit: 1***

UNIT I

History Of Red Cross - Henri Dunant's Early Life - The Battle of Solferino - The Man in White - The Birth of Red Cross - Charity in the Midst of Battle - Clara Barton: Pioneer of Disaster Relief - Death of Dunant.

UNIT II

Idea of the Red Cross Movement - Foundation of the Red Cross Movement - A Global Movement - The Emblems- History of the Emblems - Who can use the emblem in India? Misuse of the Emblem - Why respect the Emblem?

UNIT III

The Seven Fundamental Principles - International Humanitarian Law - Re Establishing Family Links

UNIT IV

Birth of the Indian Red Cross Society- Introduction to the programmes of the IRCS - Humanitarian Values - Disaster Management - Health and Care in the Community

UNIT V

Volunteering - Trainings

COURSE BOOK:

1. Rev. Sr. Dr. JesuRani, Dr. J. Arul Irudaya Jeyanthi, Dr. B. Amala Jasmine, Mrs. P. Selvarani, Mrs. K. Rani, Youth Red Cross (YRC), PCF Publications, Pandiyanadu Cultural Foundation, Madurai, 2021.

BOOKS FOR REFERENCE:

1. ''The Story of the Red Cross'', Krishna Satyanand, Reprint 2002, Published by the Director, National Book Trust, India.
2. ''Basic about YRC'', Indian Red Cross Society, National Headquarters.

YOUTH RED CROSS

Semester: III & IV **Hours: 60**

Code: 23STPRC01 **Credit: 1***

UNIT I

The International Committee of the Red Cross (ICRC) -Origin And History - International Status - ICRC - Legal Status - ICRC's Humanitarian Activities - Administration and Structure of ICRC - National Red Cross and Red Crescent Societies.

UNIT II

Interntional Federation of Red Cross and Red Crescent Societies - Mission - Strength - Global Network - International Red Cross and Red Crescent Movement - Geneva Conventions and their Additional Protocols - Protection and care - protection of persons - Protection of Civilian medical and religious personnel - Methods and means of warfare - Improper use of emblems - fundamental guarantees.

UNIT III

Indian Red Cross Society - Headquarters - Resources - Partnerships – Strategic Development plan - Indian Red Cross Society - Tamil Nadu Branch - Indian Red Cross Society, District Red Cross Branch and Sub Branch

UNIT IV

Youth Red Cross - Junior Red Cross

UNIT V

Field Visit

COURSE BOOK:

1. Rev. Sr. Dr. JesuRani, Dr. J. Arul Irudaya Jeyanthi, Dr. B. Amala Jasmine, Mrs. P. Selvarani, Mrs. K. Rani, Youth Red Cross (YRC), PCF Publications, Pandiyanadu Cultural Foundation, Madurai, 2021.

BOOKS FOR REFERENCE:

1. ''History of Red Cross'', Youth Red Cross, Indian Red Cross Society Tamil Nadu Branch.

SCHEME OF EVALUATION

1.	Summative Examination (1 hour)	:	25 marks
2.	Continuous Internal Assessment	:	75 marks
	Total	**:**	**100 marks**

Scheme of Evaluation of Continuous Internal Assessment		
1.	Field Visit	25 Marks
2.	Report	25 Marks
3.	Involvement	10 Marks
4.	Case Study	10 Marks
5.	Attendance	5 Marks
Total		***75 Marks***

Total the marks of I, II, III & IV will be converted to 75 marks

Question Pattern for Internal Examination

Total Marks:25 **Time : 1hour**

Section - A

Answer All Questions 5 x 1= 5 Marks

(Multiple Choice Questions)

Section - B

Answer All Questions 2 x 5= 10 Marks

(Either or Questions)

Section - C

Answer Any One Question 1 x 10 =10 Marks

(One Question Out of Three)

பொதுத்தமிழ் - 2

(பிறதுறை மாணவிகளுக்கு மட்டும்)

பருவம்: இரண்டு **நேரம்: 6**

குறியீடு: 23GT2GS02 **புள்ளி: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	பக்தி இலக்கியங்கள், சிற்றிலக்கியங்கள் கற்பதன் மூலம் பக்தி நெறியினையும், இலக்கியச் சுவையினையும் அறிவர்.	PSO-4	K1
CO - 2	தமிழ்ச் சமூகப் பண்பாட்டு வரலாற்றினை இலக்கியங்கள் வாயிலாகப் புரிந்து கொள்வர்.	PSO-3	K2
CO - 3	பக்தி, சிற்றிலக்கியங்களின் வழி சமய நல்லிணக்கத்தையும் பண்பாட்டு நெறிகளையும் தெரிந்து அவற்றைப் பின்பற்றப்படவேண்டிய அறிவினையும் பெறுவர்.	PSO-5	K3
CO - 4	பட்டப் படிப்பினைப் படிக்கும் போதே பெரும்பான்மையான தமிழ் இலக்கியங்கள், இலக்கணங்கள் குறித்த அறிவினைப் பெறும் திறன் பெறுவர்.	PSO-2	K4
CO - 5	போட்டித் தேர்வுகளில் வெற்றி பெறுவதற்குத் தமிழ்ப் பாடத்தின் முக்கியத்துவத்தை உணர்ந்து பயன்கொள்ளும் வகையில் ஏற்ற மொழித்திறன் பயிற்சி பெறுவர்.	PSO-1	K5

K1-நினைவு கூர்தல் K2-புரிதல், K3- பயன்படுத்துதல், K4 -பகுத்தல், K5 -மதிப்பீடு

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II			**பொதுத்தமிழ் - 2**						**Hours: 6**			
Code : 23GT2GS02			**(பிற துறை மாணவிகளுக்கு மட்டும்)**						**Credit: 3**			
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	4	2	4	3	3	4	3	2	5	4	3.55
CO - 2	4	4	5	4	4	4	4	4	5	4	4	4.18
CO - 3	3	3	3	5	4	4	3	4	3	3	5	3.64
CO- 4	3	4	3	4	5	5	4	5	3	3	4	3.91
CO - 5	3	5	3	3	2	2	5	2	3	3	3	3.09
Overall Mean Score												**3.68**

Result: The score for this course is **3.68** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

அலகு 1

திருநாவுக்கரசர் தேவாரம் - நாமார்க்கும் குடியல்லோம் எனத் தொடங்கும் பதிகம் (10 பாடல்கள்)

ஆண்டாள் திருப்பாவை - (முதல் 10 பாசுரங்கள்) **18 Hours**

அலகு 2

வள்ளலார்-அருள் விளக்கமாலை (முதல் 10 பாடல்கள்)

எச்.ஏ.கிருட்டிணப்பிள்ளை - இரட்சணியமனோகரம் - பால்ய பிராத்தனை

குணங்குடி மஸ்தான் சாகிபு-பராபரக்கண்ணி (முதல்10 கண்ணி) **18 Hours**

அலகு 3

தமிழ்விடு தூது - (முதல் 20 கண்ணி)

திருக்குற்றாலக் குறவஞ்சி-குறத்தி மலைவளம் கூறுதல்

முக்கூடற்பள்ளு-நாட்டுவளம் **18 Hours**

அலகு 4

பக்தி இலக்கியம் சிற்றிலக்கியம் தொடர்பான இலக்கியவரலாறு (பல்லவர்காலம், நாயக்கர் காலம்) **18 Hours**

அலகு 5: மொழித்திறன் / போட்டித் தேர்வுத் திறன்

1. தொடர் வகைகள்,
2. மரபுத்தொடர்,
3. பழமொழிகள்,
4. பிறமொழிச் சொற்களைக் களைதல்,
5. வழுச் சொற்கள் நீக்குதல்,
6. இலக்கணக் குறிப்பு அறிதல். **18 Hours**

(குறிப்பு: அலகு4, 5ஆகியனபோட்டித் தேர்வுநோக்கில் நடத்தப்படவேண்டும்)

பாடநூல்கள்

1. தமிழ்த்துறைவெளியீடு (தொகுப்பு) - பொதுத்தமிழ் - 2
   ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி (தன்னாட்சி),பெரியகுளம்.
2. முனைவர்சி. பாலசுப்பிரமணியன் - தமிழ் இலக்கியவாலாறு,
   பாவைபப்ளிகேஷன்ஸ்,சென்னை- 60
   இரண்டாம் பதிப்பு-2016.

பார்வை நூல்கள்

1. புலவர் பி.ரா.நடராசன் (உ.ஆ) - திருநாவுக்கரசு சுவாமிகள் தேவாரம்,
உமா பதிப்பகம்,சென்னை - 600001,
முதல் பதிப்பு - ஏப்ரல் 2003.

2. எம்.நாராயணவேலுப் பிள்ளை - நாலாயிர திவ்யப் பிரபந்தம்,
(உ.ஆ) முல்லை நிலையம்,சென்னை - 600017,
முதல் பதிப்பு - செப்டம்பர்2000.

3. திருவருட்பிரகாசவள்ளலார் - திருவருட்பா,கலைஞன் பதிப்பகம்,
சென்னை - 600017, இரண்டாம் பதிப்பு - 1885.

4. சுந்தரராசன் (உ.ஆ) - இரட்சணியமனோகரம், முல்லை நிலையம்,
சென்னை-600017,முதல் பதிப்பு - 2001.

5. கவிக்கோ அப்துல் ரகுமான் - குணங்குடியார் பாடற்கோவை,
நேஷனல் பப்ளிஷர்ஸ்,சென்னை-600017,
முதல் பதிப்பு - டிசம்பர்2008.

6. பேரா. சே.இராதாகிருஷ்ணன் - தமிழ்விடு தூது,முல்லை நிலையம்,
சென்னை-600017, இரண்டாம் பதிப்பு - 2008.

7. புலியூர்க் கேசிகன் - திருக்குற்றாலக் குறவஞ்சி,
பாவை பப்ளிகேஷன்ஸ், சென்னை-600 014,
இரண்டாம் பதிப்பு - ஜூலை2014.

8. புலியூர்க் கேசிகன் - முக்கூடற் பள்ளு, பாரி நிலையம்,
சென்னை-16, ஐந்தாம் பதிப்பு - செப்டம்பர்1993.

9. முனைவர்கோ. பெரியண்ணன் - அடிப்படைஎளியதமிழ் இலக்கணம்,
வனிதா பதிப்பகம்,சென்னை - 600 017,
முதல் பதிப்பு - 2003.

10. தமிழ் வேந்தன் - பிழையின்றி தமிழ் எழுத பேச,
அருவி வெளியீடு, சென்னை - 600 078,
முதல் பதிப்பு ஏப்ரல், 2003.

NOVEL, ONE ACT PLAY AND GRAMMAR

Semester: II **Hours:5**

Code : 23GH2GS02 **Credit:3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Reproduce words both in speaking and writing Hindi.	PSO-1	K1
CO - 2	Acquire a comprehensive knowledge of vocabulary, syntax and grammar in Hindi	PSO-4	K2
CO - 3	Identify the competence in self-expression	PSO-2	K3
CO - 4	Focus on independent learning	PSO-3	K4
CO - 5	Develop proficiency in speaking, listening, reading, and writing Hindi.	PSO-5	K5

UNIT I **(15 Hours)**

Nirmala Summary - Bahu kee Vidha (Send - Off) - Grammar-Verb - Dowry is Cruel and Taking Dowry is a Big Sin.

UNIT II **(15 Hours)**

Nirmala-Thothaaraam, Kalyaani , Mansaraam , Udhayabhanulal - Rajpoothani ka Badla (Rajputani's Revrnge) - Grammar - Tense and Voice - Identify the Sentences in Hindi using Basic Grammar.

UNIT III **(15 Hours)**

Nirmala-Sudha, Balachandrasimha, Rangeelaa Bhayee, Siyaram - Andher Nagaree (Dark City) – Grammar- Preposition - Coming out of Darkness with the Wisdom of Knowledge.

UNIT IV **(15 Hours)**

Nirmala- Pandith Motaram, Jiyaram, Bhuvana Mohan Chimhaa - Reed Kee Haddi (Back Bone) - Grammar- Conjunction - Jagdishchandra Mathur Shows the Representative of the Entire Female Race.

UNIT V **(15 Hours)**

Nirmala - Rukmani, Nirmala, Krishnaa - Grammar - Interjection, Adverb - Nirmala- a critical analysis.

COURSE BOOKS:

1. Nirmala – Novel written by Munshi Premchand, published by Hamsa Prakashan Allahabad.
2. Aadarsh Ekanki, Published by Dakshina Bharath Hindi Prachar Sabha, Thyagaraya Nagar, Chennai – 600 017.

   The following Ekankies have been prescribed

   a) Rajpoothri Ka badla – Divjendralal Rai

   b) Andher Nagaree - Bharathendu Harichandra

   c) Reed Kee Haddi – Jagadeeshachandra Maathur

   d) Bahu kee Vidha – Shri vinodh Rasthogi

BOOK FOR REFERENCE:

1. Vyakaran Hindi – written by Ramdev, Published by Hindi Bhavan, 63 Tagore Nagar, Allahabad -2.

   The following topics have been prescribed

   a) Verb

   b) Tense and Voice

   c) Adverb

   d) Prepositions

   e) Conjunctions

   f) Interjunctions

COMMUNICATIVE ENGLISH – II

Semester: II **Hours: 4**

Code : 23GE2GS02 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify skills in both writing and speaking	PSO-1	K1
CO - 2	Explain the main idea of a text	PSO-3	K2
CO - 3	Utilize website resources to enhance their language skills	PSO-2	K3
CO - 4	Categorize the rhetorical strategies and techniques used in writing and speaking	PSO-5	K4
CO - 5	Criticize the texts after comprehending	PSO-4	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**COMMUNICATIVE ENGLISH – II**							**Hours: 4**
Code : 23GE2GS02											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	4	3	3	3	4	5	3	3	3	4	3.64
CO - 2	3	3	5	4	3	3	3	4	5	3	3	3.55
CO - 3	4	2	3	5	2	2	4	5	3	2	2	3.09
CO - 4	3	5	2	3	4	5	3	3	2	4	5	3.55
CO - 5	4	4	2	4	5	4	4	4	2	5	4	3.82
Overall Mean Score												**3.53**

Result: The score for this course is **3.53** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I **12 Hours**

1. Listening and Speaking
    a. Listening and responding to complaints (Formal situation)
    b. Listening to problems and offering solutions (Informal)
2. Reading and writing
    a. Reading aloud (Brief motivational anecdotes)
    b. Writing a paragraph on a proverbial expression/motivational idea.
3. Word Power/Vocabulary
    Synonyms & Antonyms

UNIT II **12 Hours**

1. Listening and Speaking
    a. Listening to famous speeches and poems
    b. Making short speeches- Formal: welcome speech and vote of thanks.
        Informal occasions- Farewell party, graduation speech
2. Reading and Writing
    a. Writing opinion pieces (On travel, food, film /book reviews or on any contemporary topic)
    b. Reading poetry
        i. Reading aloud: (Intonation and Voice Modulation)
        ii. Identifying and using figures of speech -simile, metaphor, personification etc.
3. Word Power
    a. Idioms & Phrases

UNIT III **12 Hours**

1. Listening and Speaking
    a. Listening to Ted talks
    b. Making short presentations – Formal presentation with PPT, analytical presentation of graphs and reports of multiple kinds
    c. Interactions during and after the presentations
2. Reading and writing
    a. Writing emails of complaint
    b. Reading aloud famous speeches
3. Word Power
    a. One Word Substitution

UNIT IV **12 Hours**

1. Listening and Speaking
   a. Informal interview for feature writing
   b. Listening and responding to questions at a formal interview
2. Reading and Writing
   a. Writing letters of application
   b. Readers' Theatre (Script Reading)
   c. Dramatizing everyday situations/social issues through skits.
      (writing scripts and performing)
3. Word Power
   Collocation

UNIT V **12 Hours**

Grammar in Context

1. Adverbs & Prepositions
2. Conjunctions & Interjections
3. Sentence Patterns
4. Working with Clauses

COURSE BOOKS:

- Communicative English (For Students of Arts and Science Colleges) Tamilnadu State Council for Higher Education (TANSCHE)
- Savarimuttu, Rohan J. S, and G. Petricia Alphine Nirmala, *English Grammar and Usage - An Ideal Companion for Advanced Learners*. New Century Book House (P) Ltd, 2016.

BOOKS FOR REFERENCE

1. Kumar, Manoj.*English Communication: Theory and Practice. Scholar*. Tech Press, 2018.
2. Nachmuthu, Cambridge. *Advanced Communication English.* Cambridge Publishers, 2011.

WEB RESOURCES

https://www.youtube.com/watch?v=xZbKHDPPrrc

https://www.youtube.com/watch?v=TRcIEMgppK8

https://youtube.com/playlist?list=PLZ-F4pjbka7EIKKAwh83RDqi7Vp0q_DQp

https://www.scripts.com/script/the_chronicles_of_narnia:_the_lion,_the_witch_and_the_wardrobe_5540

PYTHON PROGRAMMING

Semester: II **Hours: 4**

Code : 23CA2MC02 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire proficiency in Python programming syntax, data types, and core concepts	PSO-1	K1
CO-2	Comprehend and design Python programs to solve various computational problems	PSO-4	K2
CO-3	Implement, and debug Python programs to address a range of computational challenges	PSO-5	K3
CO-4	Examine OOP concepts and code structures, considering factors like time complexity and resource utilization	PSO-2	K4
CO-5	Evaluate Python code for correctness and efficiency and showcase effective coding practices	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**PYTHON PROGRAMMING**							**Hours: 4**
Code : 23CA2MC02											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	4	3	4	2	5	5	3	3	4	4	3.64
CO-2	3	4	5	3	5	3	3	5	3	3	3	3.64
CO-3	5	3	3	4	2	3	3	3	3	3	5	3.36
CO-4	3	5	4	4	2	3	3	4	4	5	3	3.64
CO-5	3	3	3	5	2	3	3	3	5	3	4	3.36
Overall Mean Score												**3.53**

Result: The score for this course is **3.53** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Python Basics: Identifiers and Keywords - Python Types - Basic Types - Integer and Float Ranges -Variable Type and Assignment - Arithmetic Operators - Operation Nuances - Precedence and Associativity - Conversions - Built-in Functions - Built-in- Modules - Container Types - Python Type Jargon - Comments and Indentation- Multi-lining - Classes and Objects - Multiple Objects.**Strings and Regular Expressions:** Accessing String Elements - String Properties - Built-in Functions - String Methods - String Conversions - String Comparison- Byte Sequences - Regular Expressions - Reges Functionality - Regex Metacharacters - Regex Repetition Qualifiers- Regex Anchors- Regex Grouping. **(12 Hours)**

UNIT II

Decision Control Instruction: Decision Control Instruction - Nuances of Conditions - Logical Operators - Conditional Expressions - all ( ) and any ( ) - Receiving Input -Pass Statement. **Repetition Control Instruction:** Repetition Control Instruction - Usage of while loop- Usage of for loop - break and continue - Else Block of a Loop. **Console Input/Output:** Console Input - Console Output - Formatted Printing. **Lists:** Accessing List Elements - Looping in Lists - Basic List Operations - Using Built-in Functions on Lists - List Methods - Sorting and Reversing - List Varieties- Stack Data Structure - Queue Data Structure. **(12 Hours)**

UNIT III

Tuples: Accessing Tuple Elements - Looping in Tuples - Basic Tuple Operations - Using Built-in Functions on Tuples - Tuple Methods - Tuple Varieties.**Sets:** Accessing Set Elements- Looping in Sets - Basic Set Operations - Built-in Functions on Sets -Set Methods - Mathematical Set Operations - Updating Set Operations - Set Varieties. **Dictionaries:** Accessing Dictionary Elements- Looping in Dictionary - Basic Dictionary Operations - Built-in Functions on Dictionaries -Dictionary Methods - Dictionary Varieties. **Comprehensions:** List Comprehension - Set Comprehension- Dictionary Comprehension. **Functions:** Communication with Functions- Communication with Function - Types of Arguments. **(12 Hours)**

UNIT IV

Recursion: Repetitions - Recursive Function - When to use Recursion - Problem as Similar Sub-problems - Recursive Factorial Function - Problem with unknown loops- Types of Recursions - Recursion Limit- Iteration to Recursion. **Functional Programming:**Functions as First-Class Values -Lambda Functions- Higher Order Functions - Map, Filter, Reduce - map ( ) function - filter function ( ) -Using Lambda

with map ( ), filter ( ), reduce ( ).**Modules and Packages:** The Main Module - Multiple Modules - Importing a module -variations of import - Search Sequence - Packages - Third-party Packages. **Classes and Objects:** Programming Paradigms - Classes and Objects in Programming - User-defined Classes - Access Convention - Object Initialization - Class Variables and Methods- Vars ( ) and dir ( ) Functions - More Vars and dir ( ). **(12 Hours)**

UNIT V

Containership and Inheritance: Reuse Mechanisms - Containership - Inheritance - isinstance( ) and issubclass ( )- The Object Class - Features of Inheritance - Types of Inheritance - Abstract Classes- Runtime Polymorphism. **Exception Handling:**Syntax Errors - Exceptions- How to deal with Exceptions- How to use try except -Nuances of try and except- User-defined Exceptions- else Block- finally block- Exception Handling Tips.**File Input/Output:**I/O System - File I/O - Read/Write Operations - File Opening Modes - with Keyword - Moving Within a File - Serialization and Deserialization - Serialization of User-defined Types - File and Directory Operations. **(12 Hours)**

BOOK FOR STUDY:

- **"Let Us Python"**, YashvantKanetkar, Aditya Kanetkar, BPB Publications, India, 5thEdition, 2023.

  UNIT I **:** Chapters: 3, 4

  UNIT II **:** Chapters: 5 -8

  UNIT III **:** Chapters: 9- 13

  UNIT IV **:** Chapters: 14- 16, 18

  UNIT V **:** Chapters: 20, 22, 23

BOOKS FOR REFERENCE:

1. **"Introduction to Computing and Problem Solving Using Python"**, E. Balagurusamy, McGraw Hill Education (India) Pvt. Ltd, Nineth Reprint, 2022 .
2. **"Introduction to Programming using Python",** Y. Daniel Liang, Pearson Indian Edition, 2017.

WEB TECHNOLOGY

Semester: II **Hours: 3**

Code : 23CA2MC03 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the fundamental knowledge on Web Technology.	PSO-1	K1
CO-2	Understand basic concepts about Web Pages and Web Sites.	PSO-4	K2
CO-3	Apply the HTML tags and CSS for Webpage development.	PSO-5	K3
CO-4	Analyze basic operations on Extensible Markup Language (XML).	PSO-2	K4
CO-5	Evaluate the usability of various Objects and control structures in Java Script.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**WEB TECHNOLOGY**							**Hours: 3**
Code : 23CA2MC03											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	4	3	4	2	5	5	3	3	4	4	3.64
CO-2	3	4	5	3	5	3	3	5	4	3	3	3.73
CO-3	5	3	3	4	2	3	3	3	3	4	5	3.45
CO-4	3	5	4	4	3	3	3	4	4	5	3	3.73
CO-5	4	3	3	5	2	3	3	3	5	3	4	3.45
Overall Mean Score												**3.60**

Result: The score for this course is **3.60**(**High** Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Introduction to Web Development Strategies: History of Web- Protocols Governing Web- Creating Websites for Individual and Corporate World- Cyber Laws= Web Applications- Writing Web Projects - Identification of Objects and Target Users - Web Team - Planning and Process Development - Communication- Multi-Departmen.t and Large Scale Sites- Quality Assurance- Technical Advances for Web Team- Search Engines- E-Commerce- Traditional Commerce- Designing Strategies- Skillset needed for Web Team- Database to Web Application.

(9 Hours)

UNIT II

Introduction to HTML: Introduction- HTML browsers- Different versions of HTML - DHTML- XML- HTML tags- Attributes- Nesting tags -Quotation marks- Spacing- Special Symbols- Tags with Automatic Line Breaks- Document Overview- Header Elements- Section Headings- Block headings- Lists - inline elements- Images- Working with Tables- Working with Forms - Working with Frames. **(9 Hours)**

UNIT III

Cascade Style Sheets (CSS): Introduction to CSS-Creating Style Sheets- Common Tasks with CSS- Colours- The Font-Family. **(9 Hours)**

UNIT IV

Extensible Markup Language (XML): Introduction - Features of XML - Structure of XML document - Structures in XML- Creating Document Type Declarations - Flow Objects. **(9 Hours)**

UNIT V

Java Script: Introduction - Operators - Assignments - Comparisons - Reserved Word - Reserved by Java - Words to be Avoided - Browsers to use - Software Requirement - Starting with Java Script - Using Quotes - Using Alert - Functions - eval function - Using Statements in Java - Working with Objects - Properties- Browser Objects- Date Object- Math Object - String Object - Handling Events in Java -Form Elements- Actions- Frame Object- Document Object - Navigator Object - Screen Object - Using Images and Math - Images and Animation - Area Object - Math Object. **(9 Hours)**

BOOK FOR STUDY:

- **"Internet and Web Technology"**, A. Ravichandran, Khanna Book Publishing CO. (P) Ltd, 2013.

  Unit I **:** Chapter : 1

  Unit II **:** Chapters : 2

  Unit III **:** Chapters : 3

  Unit IV **:** Chapters : 4

  Unit V **:** Chapters : 5

BOOKS FOR REFERENCE:

1. **"Web Technology: A Developer's Perspective",** N. P. Gopalan, J. Akilandeswari, Eastern Economy Edition, 2007
2. **"Web Technology and Design", C. Xavier, New Age International Publishers,** 2009.

PYTHON PROGRAMMING LAB

Semester: II **Hours: 4**

Code : 23CA2CP02 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire proficiency in Python programming syntax, data types, and core concepts	PSO-1	K1
CO-2	Comprehend and design Python programs to solve various computational problems	PSO-4	K2
CO-3	Implement, and debug Python programs to address a range of computational challenges	PSO-5	K3
CO-4	Examine OOP concepts and code structures in Python	PSO-2	K4
CO-5	Evaluate Python code for correctness and efficiency and showcase effective coding practices	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II							**PYTHON PROGRAMMING LAB**						**Hours: 4**
Code : 23CA2CP02													**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**						**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	**6**	
CO-1	3	4	3	4	3	5	5	3	3	4	4	3	3.73
CO-2	3	4	5	3	5	3	3	5	3	3	3	3	3.64
CO-3	5	3	3	4	2	4	3	3	4	3	5	5	3.55
CO-4	4	5	4	4	2	3	3	4	4	5	3	3	3.73
CO-5	3	3	3	5	2	3	3	3	5	3	4	3	3.36
Overall Mean Score													**3.60**

Result: The score for this course is **3. 60** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

1. Write a python program to perform different arithmetic operations
2. Write a python program to find the sum of digits of a number
3. Write a python program to convert temperature in Celsius to Fahrenheit
4. Write a python program to construct patterns, using a nested for loop.

```
        1                    *
      2   2                *   *
    3   3   3            *   *   *
  4   4   4   4        *   *   *   *
```

5. Write a python script that prints 'N' prime numbers
6. Write a program for String Manipulation
7. Write a python program to demonstrate working with Sets.
8. Write a program to create, append and remove lists in python
9. Write a program to demonstrate working with tuples in python
10. Write a program to demonstrate working with dictionaries in python
11. Create a menu driven Python program with a dictionary for words and their meanings.
12. Write a python program to find the factorial of a number using function
13. Write a python program to generate Fibonacci numbers using Recursive Function
14. Write a python program to define a module and import a specific function in that module to another program
15. Create a Turtle graphics window with specific size.
16. Write a python Class to prepare Marksheet for 'N' Students.
17. Write a python program to create and import package
18. Write a python program to implement Inheritance
19. Write a python program for Exception Handling
20. Write a python program for file handling.

STATISTICAL METHODS AND ITS APPLICATIONS

Semester: II **Hours: 3**

Code : 23CA2AC2A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge on statistical methods and its applications	PSO-1	K1
CO - 2	Understand the simplex methods in Geometric Mean and Harmonic Mean Problems	PSO-2	K2
CO - 3	Build and solve Moments, Skewness and Kurtosis problems using appropriate method.	PSO-5	K3
CO - 4	Analyze the applications of Correlation and Regression	PSO-4	K4
CO - 5	Evaluate the theory of attributes techniques in Ultimate class frequencies	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II			**STATISTICAL METHODS AND ITS APPLICATIONS**								**Hours: 3**
Code : 23CA2AC2A											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**				**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**
CO - 1	3	3	4	3	2	5	5	4	3	3	4	3.55
CO - 2	3	3	5	4	5	3	3	5	3	3	4	3.73
CO - 3	5	3	3	4	2	3	3	3	3	3	5	3.36
CO - 4	3	5	3	4	2	3	3	3	4	5	2	3.36
CO - 5	3	3	3	5	2	3	3	3	5	2	3	3.18
										Overall Mean Score		**3.44**

Result: The Score for this Course is: **3.44** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Frequency Distribution: Introduction - Collection of Data - Classification of Data - Class Intervals and Frequency Distribution - Frequency Curve and Cumulative Frequency Curve. **Central Tendencies:** Introduction - Arithmetic Mean - Partition Values (Median, Quartiles, Deciles and Percentiles) (Sums only) **(9 Hours)**

UNIT II

Mode: Geometric Mean and Harmonic Mean - Relative Advantages of Different Averages. **Measures of Dispersion:** Introduction - Measures of Dispersion - Standard Deviation. **(9 Hours)**

UNIT III

Moments, Skewness and Kurtosis: Introduction- Moments - The r^{th}moment about any point A - r^{th}central moment - Karl Pearson's β and γ coefficients. Skewness and Kurtosis: Positive skewness - Negative skewness - Absolute measures of skewness - Karl Pearson's coefficient of skewness - Kurtosis. **Curve Fitting:** Principles of least squares - Fitting a straight line - Fitting a second-degree parabola. **(9 Hours)**

UNIT IV

Correlation and Regression: Introduction - Correlation - Direct (positive) - Inverse (negative) - Perfect - Covariance - Perfect and positive - Perfect and negative - Uncorrelated. **Rank Correlation:** Spearman's formula- Regression line of y on x - Regression line of x and y - Regression coefficient of y on x - Regression coefficient to x on y-Correlation coefficient for a bivariate frequency distribution. **(9 Hours)**

UNIT V

Theory of Attributes: Introduction - Attributes - Positive class - Negative class - Class of n^{th}order - Class frequency - Positive class frequencies - Negative class frequencies - Contrary frequencies - Ultimate class frequencies - Dichotomisation. Consistency of data: Consistent - Inconsistent. Independence and association of data: Independent - Association and coefficient association - Associated - Positively associated - Negatively associated - Coefficient of association - Yule's coefficient. **(9 Hours)**

BOOK FOR STUDY:

- **"Statistics"**, Arumugam, Issac, New Gamma Publishing House, Palayamkottai, July 2013.

  Unit I : Chapters: 1, 2 (2.1 & 2.2) (Sums only)

  Unit II : Chapters: 2 (2.3 - 2.5), 3 (3.1) (Sums only)

  Unit III : Chapters: 4, 5 (Sums only)

  Unit IV : Chapter: 6 (Sums only)

  Unit V : Chapter: 8 (Sums only)

BOOKS FOR REFERENCE:

1. "**Statistics for Management**", Richard I. Levin, David S. Rubin, Masood H. Siddiqui, Sanjay Rastoji, Eighth Edition, Pearson Publication Pvt. Ltd., 2018.
2. **"Probability and Statistics",** Rukmangadachari E., Pearson India Education Services Pvt. Ltd., 2002.

GRAPH THEORY

Semester: II **Hours: 3**

Code : 23CA2AC2B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	K LEVEL
CO-1	Acquire a comprehensive understanding of fundamental graph theory concepts	PSO-1	K1
CO-2	Understand the theoretical foundations of graph theory and recognize various types of graphs	PSO-2	K2
CO-3	Apply the graph theory concepts to solve complex problems	PSO-5	K3
CO-4	Analyze the efficiency and correctness of graph theory techniques	PSO-4	K4
CO-5	Evaluate the relevance of graph theory in computer application and various other disciplines.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**GRAPH THEORY**								**Hours: 3**
Code : 23CA2AC2B												**Credit: 3**
Course Outcomes	**Programme Outcomes(PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	3	4	3	2	5	5	4	3	3	4	3.55
CO-2	3	3	5	3	5	3	3	5	3	3	4	3.64
CO-3	5	3	3	4	2	3	3	2	3	3	5	3.27
CO-4	3	5	3	4	2	3	2	3	4	5	2	3.27
CO-5	3	3	3	5	2	3	3	3	5	2	3	3.18
Overall Mean Score												**3.38**

Result: The score for this course is **3.38** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

An Introduction to Graphs: The Definition of a Graph - Graphs as Models - More Definitions - Vertex Degrees - Subgraphs. **(9 Hours)**

UNIT II

Trees and Connectivity: Definitions and Simple Properties - Bridges - Spanning Trees - Connector Problems. **(9 Hours)**

UNIT III

Euler Tours and Hamiltonian Cycles: Introduction - Euler Tours - The Chinese Postman Problem - Hamiltonian Graphs - The Travelling Salesman Problem. **(9 Hours)**

UNIT IV

Matchings: Introduction - Matchings and Augmenting Paths - The Marriage Problem - The Personnel Assignment Problem - The Optimal Assignment Problem - A Chinese Postman Problem Postscript. **(9 Hours)**

UNIT V

Planar Graphs: Introduction - Plane and Planar Graphs - Euler's Formula - The Platonic Bodies - Kuratowaki's Theorem. **(9 Hours)**

BOOK FOR STUDY:

- "**A First Look at Graph Theory**, John Clark, Derek Allan Holton World Scientific Publishing Co. Pvt. Ltd, First Indian Reprint 1995.

  Unit I **:** Chapter 1:1.1 - 1.5

  Unit II **:** Chapter 2: 2.1 -2.4

  Unit III **:** Chapter 3: 3.1 - 3.4

  Unit IV **:** Chapter 4: 4.1 - 4.5

  Unit V **:** Chapter 5: 5.1 - 5.4

BOOKS FOR REFERENCE:

1. "**Graph Theory with Applications**", Bondy, J. A. and Murty, U.S.R., North Holland Publication, 2008.
2. **"Introduction to Graph Theory",** West, D. B, Pearson Education, 2011.

WEB DESIGNING LAB

Semester: II **Hours: 2**

Code : 23CA2AP02 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	K LEVEL
CO - 1	Acquire the basic knowledge on webpage and website	PSO-1	K1
CO - 2	Understand the skills to create web pages using images and hyperlinks.	PSO-2	K2
CO - 3	Develop web pages by using HTML tags and CSS style sheets	PSO-5	K3
CO - 4	Analyze the result of implementing Java Script in web page designing	PSO-4	K4
CO - 5	Create websites with application forms and frames	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**WEB DESIGNING LAB**							**Hours: 2**
Code : 23CA2AP02											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	4	3	2	5	5	4	3	3	4	3.55
CO - 2	3	4	5	3	5	3	3	5	3	3	4	3.73
CO - 3	5	3	3	4	2	3	3	3	4	3	5	3.45
CO - 4	3	5	3	4	3	3	2	3	4	5	3	3.45
CO - 5	3	3	3	5	3	3	3	3	5	2	3	3.27
Overall Mean Score												**3.49**

Result: The score for this course is **3.49** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

1. Create a Webpage about your college with all formatting tags
2. Create a Webpage for the demonstration of Lists.

    a. Ordered List

    b. Unordered List

    c. Definition List

    d. Nested List
3. Create a Webpage using images.
4. Create a Webpage for your Department using Hyperlinks.
5. Create a Webpage to display your department time table.
6. Create an Application Form to get admission in JAC.
7. Create a Home page for your College Library using frames
8. Write a Webpage to demonstrate the usage of inline CSS.
9. Write a Webpage to demonstrate the usage of internal CSS.
10. Write a Webpage to demonstrate the usage of external CSS.
11. Create a website for your department. Use hyperlinks, images, etc.,
12. Write a Java Script to display your contact details
13. Write a Java Script for Arithmetic Operations
14. Write a Java Script to check the given number is prime or not
15. Write a Java Script to find out the sum of digit of a number.
16. Write a Java Script to convert Decimal number to binary.
17. Create a login form and validate the username and password using Java Script

ABILITY ENHANCEMENT COURSE-2 (AEC-2)

SUSTAINABILITY LIFE SKILLS

PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Gain theoretical knowledge and apply the expertise in different fields.
2.	Acquire Industry specific skills and can emerge as entrepreneurs.
3.	Develop critical and rational thinking to solve societal issues.
4.	Explore the knowledge and acclimatize it in the ever changing work environment.
5.	Evolve theories and develop innovative discipline specific ideas.
6.	Comprehend the nuances and develop innovative, discipline-specific ideas.

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Develop self-awareness, empathy and problem-solving.	PO-1
2.	Apply critical thinking, leadership and creativity.	PO-2
3.	Gain entrepreneurial, management and communication skills.	PO-3
4.	Practice digital responsibility, inclusiveness and technology use.	PO-4, PO-6
5.	Promote SDGs, community empowerment and sustainability.	PO-5

SUSTAINABILITY LIFE SKILLS

Semester: II **Hours: 2**

Code : 23AE2VE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall and describe concepts of self-awareness, empathy and stress management.	PSO-1	K1
CO - 2	Explain and interpret critical thinking, leadership, motivation and creativity.	PSO-2	K2
CO - 3	Apply entrepreneurial, financial and time-management skills in practical contexts.	PSO-3	K3
CO - 4	Analyze digital responsibility, inclusiveness and safe social media practices.	PSO-4	K4
CO - 5	Evaluate the relevance of Sustainable Development Goals for personal and social growth.	PSO-5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**SUSTAINABILITY LIFE SKILLS**							**Hours: 2**
Code : 23AE2VE02											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	3	4	3	5	2	3	3	4	3.36
CO - 2	3	5	3	2	4	2	3	5	3	2	4	3.27
CO - 3	3	2	5	3	4	3	3	2	5	3	4	3.36
CO - 4	2	3	4	5	3	5	2	3	4	5	3	3.55
CO - 5	2	4	4	3	5	3	2	4	4	3	5	3.55
Overall Mean Score												**3.41**

Result: The score for this course is **3.41** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I **6 Hours**

Self - Awareness - Empathy - Sympathy - Self-management - Stress Management- Interpersonal Relationship-Accepting Criticism- Problem Solving.

UNIT II **6 Hours**

Lateral thinking-Reasoning-motivation and goal setting- Critical thinking- leadership qualities- Social Etiquettes- Positive attitude- Creativity and components of creativity.

UNIT III **6 Hours**

Entrepreneurial Skills- Money Management-Time Management-Communication- Digital Marketing, Questioning, Observing, Networking

UNIT IV **6 Hours**

Safe Usage of social media- Gender Sensitivity-Inclusiveness-Morphing - Cyber Bulling- some useful apps- mPassport Seva- mParivahan- epathshala -epariksh- Aarogya sethu- Indian Police at your call- mAadhaar- GST Rate Finder-Umang- Sarkari Naukri-SWAYAM.

UNIT V **6 Hours**

Sustainable Development Goals.

1.No Poverty, 2.Zero Hunger 3.Good Health and Well-being 4.Quality Education 5.Gender Equality 6.Clean Water and Sanitation 7.Affordable and Clean Energy 8.Decent Work and Economic Growth 9.Industry, Innovation and Infrastructure 10.Reduced Inequality 11.Sustainable Cities and Communities 12. Responsible Consumption and Production 13. Climate Action 14. Life Below Water 15. Life on Land 16. Peace, Justice and Strong Institutions 17. Partnerships for the Goal.

COURSE TEXT:

- Prepared by the members of Foundation Course.

BOOKS FOR REFERENCE:

1. Pearson, Mark. *Emotional Healing & Self-Esteem*, Australian Educational Research, 1998.
2. Kemp. Sid. *Project Management for Small Business Made Easy*, Entrepreneur Press, 2006.
3. Oxley, Alan. *Security Risks in Social Media Technologies. Safe Practices in Public Service Applications*, Chandos Publishing, 2013.
4. Bigg, Tom & Mohammed Valli Moosa, editors. *Survival for a Small Planet: The Sustainable Development Agenda,* Earthscan Publications Ltd, 2004.

WEB-SOURCES

1. https://www.skillsyouneed.com/rhubarb/core-life-skills.html
2. http://www.linkedin.com/pulse/what-makes-positive-attitude-10-components-gary
3. http://ifflab.org/how-to-prevent-cyber-bullying-anti-cyber-bullying-law-in- india/
4. http://www.sciencedaily.com/terms/morphing.htm#:text=Morphing%20is%special%effect,little%20 instruction%20 from%20the%20 user.
5. https://apps.gov.in/apps
6. https://sdgs.un.org/goals
7. https://www.indeed.com/career-advice/career-development/ entrepreneurial-skills

EFFECTIVE ENGLISH

Semester: II **Hours: 2**

Code : 23SE2CE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify their abilities to become better speakers and communicators	PSO-1	K1
CO - 2	Relate their speaking ability in English both in terms of fluency and comprehensibility.	PSO-2	K2
CO - 3	Modify their vocabulary in the context for communication	PSO-4	K3
CO - 4	Analyze their formal and informal communications with better use of words in appropriate contexts	PSO-5	K4
CO - 5	Assess conversations and present their viewpoints and opinions	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: II				**EFFECTIVE ENGLISH**							**Hours: 2**
Code : 23SE2CE02											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	3	3	3	3	5	3	3	3	3	3.36
CO - 2	4	3	3	5	3	3	4	5	3	3	3	3.55
CO - 3	4	2	2	2	5	2	4	2	2	5	2	2.91
CO - 4	4	5	3	3	3	5	4	3	3	3	5	3.73
CO - 5	4	3	5	3	3	3	4	3	5	3	3	3.55
Overall Mean Score												**3.42**

Result: The score for this course is **3.42** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I: Easy Enacting **6 Hours**

Orator - Chamber 4 (Paper 1)

Introducing oneself (Unit 4, Lesson 2)

Student and Teacher (Unit 3 Lesson 3)

In a College Campus (Unit 4, Lesson 1)

Orator- Chamber 4 (Paper 2)

Introducing a Person (Unit 1, Lesson 3)

Inviting for a Birthday Party Unit 2, Lesson 1 & 2)

Ordering for Food (Unit 1, Lesson 4)

UNIT II: Perfecting Phrasal Verbs **6 Hours**

Orator- Chamber 3

Phrasal Verbs in Conversation

Phrasal Verbs for Situations (Describing Place, Time, Daily Routines, Feelings, Health and Socializing)

UNIT III: Captivating Collocation **6 Hours**

Orator- Chamber 4

Types of Collocation

Collocation for Situations

UNIT IV: Idiomatic Expression **6 Hours**

Orator- Chamber 5

Idioms for Conversation

Idioms for Situations

UNIT V: Grammar for Life **6 Hours**

Orator- Chamber 7

Articles, Prepositions, Pronouns, Tenses, Modals (Unit 1 to 5)

INTERNAL COMPONENTS

Test 1	40
Test 2	40
Situational Conversation	10
Designing Brochure/Invitation	5
Attendance	5
Total	**100**

பொதுத்தமிழ் - 3 (பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: மூன்று **நேரம்: 6**

குறியீடு: 23GT3GS03 **புள்ளி: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	காப்பியங்களின் வழி வாழ்வியல் சிந்தனையை அறிவர்.	PSO-5	K1
CO - 2	காப்பியங்களில் தமிழ்மொழியின் உயர்வை உணர்வர்.	PSO-2	K2
CO - 3	சமகாலப் படைப்புகளின் சிறப்புக்கூறுகளைப் பயன்படுத்தும் ஆற்றலை அறிந்து கொள்வர்.	PSO-3	K3
CO - 4	காப்பியங்கள் மூலம் இலக்கியங்களின் முக்கியத்துவத்தைப் பகுத்தாராயும் திறனை அறிவர்.	PSO-4	K4
CO - 5	மாணவர்கள் படைப்புத்திறனை மதிப்பீடு செய்ய அறிந்து கொள்வர்.	PSO-1	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III							**பொதுத்தமிழ் - 3 (பிற துறை மாணவிகளுக்கு மட்டும்)**					**Hours: 6**
Code : 23GT3GS03												**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	4	5	4	4	3	4	4	3	5	3.82
CO - 2	3	3	4	4	5	5	3	5	4	3	4	3.91
CO - 3	3	4	5	4	4	4	4	4	5	3	4	4.00
CO- 4	5	3	3	4	4	4	3	4	3	5	4	3.82
CO - 5	3	5	4	3	3	3	5	3	4	3	3	3.55
Overall Mean Score												**3.82**

Result: The score for this course is **3.82** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

அலகு 1: பெருங்காப்பியங்கள்

சிலப்பதிகாரம் - வழக்குரை காதை

மணிமேகலை - ஆதிரை பிச்சையிட்ட காதை

சீவகசிந்தாமணி - பூமகள் இலம்பகம் (பாடல் எண் 2327 - 2336)

"கண்ணாடி யன்ன.... "முதல் "தேம்பெய் கற்பகத்.. வரை

வளையாபதி - கற்பில் மகளிர் (பாடல் எண் -8,9,10,11)

"பள்ள முதுநீர்ப் ....."

"உண்டியுட் காப்புண் ....."

" எத்துணை யாற்று ...."

"தனிப்பெயற் றண்டுளி ....." **18 Hours**

அலகு 2: சமயக் காப்பியங்கள்

பெரியபுராணம் - பூசலார் நாயனார் புராணம்

கம்பராமாயணம் - மந்தரை சூழ்ச்சிப்படலம் (பாடல் எண் 1399 - 1428)

"ஆண்டை அந்நிலை ....." முதல் "ஏனைநீதி இணையன ...." வரை

வில்லிபாரதம் - மற்போர் சுருக்கம்

சீறாப்புராணம் - புலிவசனித்த படலம் **18 Hours**

அலகு 3: புதினம்

வஞ்சிமாநகரம் (வரலாற்றுப் புதினம்) **18 Hours**

அலகு 4

பாடம் தழுவிய இலக்கிய வரலாறு **18 Hours**

அலகு 5

மொழித்திறன்

1. நூல் மதிப்புரை 2. கடிதம் வரைதல் **18 Hours**

பாடநூல்கள்

தமிழ்த்துறை வெளியீடு (தொகுப்பு) - பொதுத்தமிழ் - 3

ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி

(தன்னாட்சி), பெரியகுளம்.

முனைவர் சி. பாலசுப்பிரமணியன் - தமிழ் இலக்கிய வரலாறு

பாவை பப்ளிகேஷன்ஸ்,

சென்னை - 60. இரண்டாம் பதிப்பு - 2016.

நா. பார்த்தசாரதி - வஞ்சி மாநகரம் (வரலாற்றுப் புதினம்)

பாவை பப்ளிகேஷன்ஸ், சென்னை - 600 014

முதற்பதிப்பு ஏப்ரல் 2012

பார்வை நூல்கள்

ந.மு. வேங்கட சாமி நாட்டார் (உ.ஆ)	-	சிலப்பதிகாரம் மூலமும் உரையும், ராமையா பதிப்பகம், சென்னை - 14, 10 ஆம் பதிப்பு 2019.
ந.மு. வேங்கடசாமி நாட்டார், ஔவை சு.துரைசாமிப்பிள்ளை (உ.ஆ)	-	மணிமேகலை மூலமும் உரையும் சாரதா பதிப்பகம், சென்னை - 600014 ஏழாம் பதிப்பு 2019
உரை ஆசிரியர் குழு	-	சீவக சிந்தாமணி மூலமும் உரையும், சாரதா பதிப்பகம், சென்னை - 14 2 ஆம் பதிப்பு - 2020
புலமை வேங்கடாசலம்	-	வளையாபதி, பாவை பப்ளிகேஷன்ஸ் சென்னை - 14 முதல் பதிப்பு மே 2006
கவிஞர் வ.த.இராமசுப்பிரமணியம் எம்.ஏ (உ.ஆ)	-	பெரியபுராணம் மூலமும் தெளிவுரையும் இரண்டாம் காண்டம், வெங்கட் நாராயணா ரோடு, டி. நகர், சென்னை -17. முதற்பதிப்பு மார்ச்சு 2004
பேராசிரியர் அ.ச. ஞானசம்பந்தன் முதன்மைப் பதிப்பாசிரியர்	-	கம்பராமாயணம் அயோத்தியா காண்டம் 2 நியூ செஞ்சுரி புக்ஹவுஸ் (பி.லிட்) சென்னை - 98. முதல் பதிப்பு டிசம்பர் 2012.
எஸ்.விசுவநாதன் (பதிப்பாசிரியர்)	-	வில்லிபாரதம் இரண்டாம் பாகம் தம்பி செட்டி தெரு சென்னை -1 முதல் பதிப்பு 1959

Poetry and History of Hindi Literature, Technical Hindi

Semester: III **Hours: 5**

Code : 23GH3GS03 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Learn the reform work done by Saint Kabirdas and Saint Tulasidas	PSO-1	K1
CO - 2	Develop Official and General Knowledge.	PSO-4	K2
CO - 3	Know the Origin of Bhakthi Movement.	PSO-2	K3
CO - 4	Develop Analysis Skills .	PSO-3	K4
CO - 5	Creative Writing will be Developed.	PSO-5	K5

UNIT I **(15 Hours)**

- Sachche Devtha
- Kabir Ke Dohe - 5 numbers
- "Gyan Margi Shakha - Prominent Poets and their Poems" - Kabirdas in detailed.

UNIT II **(15 Hours)**

- Murjhaphool
- Tulasi Ke Dohe - 5 numbers
- "Ram Bhakthi Shakha - Prominent Poets and their Poems" -Tulasidas in detailed.

UNIT III **(15 Hours)**

- Vivashtha
- Deep Koyee Jal Raha Hai
- "Krishna Bhakthi Shakha - Prominent Poets and their Poems" - Surdas in detailed.

UNIT IV **(15 Hours)**

- Badhal
- "Prem Margi Shakha - Prominent Poets and their Poems" - Jayasi in detailed.
- Technical Hindi:

  Banking Terms : 50 only

  Name of the Ministries: 50 only

UNIT V **(15 Hours)**

- Vashand Aayaa
- Short Notes from Reethikal and Adunikkal: Chayavad , Mythili Sharan, Meera Bhaayi, Ameer Khusro.
- Technical Hindi: E-mail kaa Upayog

COURSE BOOKS:

1. Kavya Saurab Published by Dakshina Bhaaratha Hindi Prachar Sabha, T. Nagar, Chennai-600 017.

The following poems have been prescribed

- ❖ Sachche Devtha - Ayodhya Singh Upadhyay Harioudh
- ❖ Murjhaphool - Mahadevi Varma
- ❖ Vivashtha - Shivamangala Simh Suman
- ❖ Deep Koyee Jal Raha Hai - Ramnaresh Thiripati
- ❖ Badhal - Sumithranandhan panth
- ❖ Vashand Aayaa - Suryakanth Thripati Niraalaa
- ❖ Kabir ke Dohe
- ❖ Tulasi ke Dohe

2. Hindi Sahithiya kaa Sanchiptha Ithihaas - Published by Dakshina Bharath Hindi Prachar Sabha, Thyagaraya Nagar, Chennai - 600 017.

The following Bakthi kaal have been prescribed

- ❖ Gyan marg, Prem maarg, Rambakthi, Krishnabakthi
- ❖ Adunikkal & Reethikkal Notes: Chayavad, Mythili Sharan, Meera Bhaayi, Ameer Khusro.

BOOKS FOR REFERENCE:

1. Technical Hindi - Karyalaya Sahayika, Kendriya Sachivalaya Hindi Parishad New Delhi, Hindi Vathayan Dr.K.Chandra Mohan, Viswa Vidhyalaya Prakashan Varanashi.

The following topics have been prescribed

- ❖ Banking Terms - 50 only
- ❖ Name of the Ministries - 50 only
- ❖ E-mail kaa Upayog

COMMUNICATIVE ENGLISH - III

Semester: III **Hours: 4**

Code : 23GE3GS03 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify cultural diversity and divergence in perspectives.	PSO-3	K1
CO - 2	Interpret their skills and attitudes relevant to the emerging society.	PSO-2	K2
CO - 3	Produce grammatically and idiomatically correct language.	PSO-1	K3
CO - 4	Categorize the writing techniques to meet academic and professional needs.	PSO-4	K4
CO - 5	Plan for career oriented tests with sufficient practice in Grammar and Comprehension.	PSO-5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III							**COMMUNICATIVE ENGLISH - III**					**Hours: 4**
Code : 23GE3GS03												**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	5	2	2	3	3	2	5	2	3	3.0
CO - 2	3	2	2	5	2	2	3	5	2	2	2	2.73
CO - 3	5	3	3	2	2	3	5	2	3	2	3	3.0
CO - 4	3	3	2	3	5	3	3	3	2	5	3	3.18
CO - 5	2	5	2	2	4	5	2	2	2	4	5	3.18
Overall Mean Score												**3.02**

Result: The score for this course is **3.02** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I: POETRY **12 Hours**

Mamang Dai	-	"The Voice of the Mountains"
Toru Dutt	-	"Sita"
Oodgeroo Noonuccal	-	"A Song of Hope"
Christina Rossetti	-	"In an Artist's Studio"

UNIT II: SCENES FROM SHAKESPEARE **12 Hours**

Romeo & Juliet	-	The Balcony Scene
Macbeth	-	The Banquet Scene
Julius Caesar	-	The Murder Scene

UNIT III: SPEECHES OF FAMOUS PERSONALITIES **12 Hours**

Jawaharlal Nehru	-	"A Tryst with Destiny"
Barack Obama	-	"Yes, We Can"
Steve Jobs	-	"You've Got to Find What You Love"

UNIT IV: GRAMMAR IN CONTEXT **12 Hours**

Articles, Determiners and Quantifiers

Linking Words/ Connectives

Compound Words

Direct and Reported Speech

UNIT V: LANGUAGE COMPETENCY

Writing letters and emails

Writing in Social media platforms

[Blogs, X, Instagram, Facebook]

Learning etiquette and Email Etiquette **12 Hours**

COURSE BOOKS:

- Course Materials will be provided by the Department of English.
- Savarimuttu, Rohan J. S, and G. Petricia Alphine Nirmala, *English Grammar and Usage - An Ideal Companion for Advanced Learners*. New Century Book House (P) Ltd, 2016.

BOOKS FOR REFERENCE

1. Stanley Wells, *The Shakespeare Book: Big Ideas Simply Explained*, DK Publishing, 2015.
2. Jeane Kelly Bernish, *Build a Professional Digital Profile.* Kindle Edition, Bernish Communications Associates, LLC; 1st edition, 2012.
3. Krysia M Yardley- Matwiejczuk, *Role Play-Theory and Practice.* SAGE publications ltd, 1997.

WEB SOURCES

https://www.scribd.com/document/558838656/The-Voice-of-the-Mountain-By-Mamang-Dai-Adivasi-Resurgence

http://www.wordslikethis.com.au/a-song-of-hope/

https://www.poetryfoundation.org/poems/146804/in-an-artist39s-studio

https://www.poetrynook.com/poem/s%E2%94%9C%C2%ABta

https://www.cam.ac.uk/files/a-tryst-with-destiny/index.html#:~:text=Jawaharlal%20Nehru%2C%20delivering%20his%20Tryst%20with%20Destiny%20speech.&text=%22Long%20years%20ago%20we%20made,awake%20to%20life%20and%20freedom.

DATA STRUCTURE AND ALGORITHMS

Semester: III **Hours: 5**

Code : 23CA3MC04 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire knowledge on the principles and applications of algorithms.	PSO - 1	K1
CO - 2	Understand how to represent data items in data structures and algorithms.	PSO - 2	K2
CO - 3	Demonstrate proficiency in practical implementations and applications. Various operations on graphs and their applicability.	PSO - 5	K3
CO - 4	Analyze the efficiency of data structures and algorithms for solving diverse computational problems. Implement hash tables, heaps, and AVL trees.	PSO - 4	K4
CO - 5	Evaluate various sorting and searching algorithms.	PSO - 3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III				**DATA STRUCTURE AND ALGORITHMS**							**Hours: 5**
Code : 23CA3MC04											**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	4	3	2	5	5	4	3	3	4	3.55
CO - 2	3	4	5	3	5	3	4	5	3	3	4	3.82
CO - 3	5	3	3	4	2	4	3	3	4	3	5	3.55
CO - 4	3	5	4	4	3	3	2	3	4	5	3	3.55
CO - 5	3	3	3	5	3	3	3	3	5	3	3	3.36
Overall Mean Score												**3.57**

Result: The score for this course is **3.57** (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	4
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 -4.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Introduction to Algorithms and Data Structures: Introduction - Algorithms: characteristics of algorithm - Analysis of complexity - time complexity - Asymptotic notation - space complexity - Data Structures. **(12 Hours)**

UNIT II

Linear Data Structures: Introduction - Arrays. Lists - Singly Linked Lists - Doubly Linked Lists - Circular Linked Lists - Linked List with Header Nodes - Multi-Lists - Addition of Two Polynomials - Sparse Matrices - Arrays versus Linked Lists - Stacks - Queues. **(12 Hours)**

UNIT III

Non-Linear Data Structures: Introduction - **Trees:** Definition - General Trees - Binary Tree - Terminologies - Types of Binary Trees - Representation of Binary Trees - Traversal of Binary Trees - Threaded Binary Trees - Binary Search Trees. **Graphs:** Definition - Terminologies and Types of Graphs - Representation of Graphs - Traversals - Applications. **(12 Hours)**

UNIT IV

Advanced Data Structures: Introduction - Hash Tables - Heaps - AVL Trees - B+ Trees. **Sorting:** Introduction - Types of Sorting Algorithms - Sorting Techniques - Time Complexity of Sorting Techniques. **(12 Hours)**

UNIT V

File Structures: Introduction - Definitions and Concepts - Physical Structure of Hard Disk - File Operations - File Organization. **(12 Hours)**

COURSE BOOK:

- R. Venkatesan, S. Lovelyn Rose, **"Data Structures",** Wiley, Second Edition, 2019.

  UNIT I: Chapter: 1

  UNIT II: Chapter: 2

  UNIT III: Chapter: 3

  UNIT IV: Chapters: 4 (4.1 - 4.4, 4.6), 5

  UNIT V: Chapter: 6

BOOKS FOR REFERENCE:

1. Thomas H. Cormen, Chales E. Leiserson, Ronald L. Rivest, Clifford Stein, "**Introduction to Algorithms**", McGraw Hill Publication, 3rd Edition, 2009,
2. Aho, Hopcroft and Ullman, **Data Structures and Algorithms**", Pearson Education 2003.
3. Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, **"Fundamentals of Data Structures in C++",** University Press, Second Edition, Reprint 2013.
4. ISRD Group, **"Data Structures through C++",** Tata McGraw Hill Education, 2011.

WEB RESOURCES:

1. https://www.geeksforgeeks.org/data-structures/
2. https://www.programiz.com/dsa
3. https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/
4. https://www.tutorialspoint.com/data_structures_algorithms/index.htm

DATA STRUCTURE AND ALGORITHMS LAB

Semester: III **Hours: 4**

Code : 23CA3CP03 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain knowledge on the principles and applications of data structures and algorithms	PSO - 1	K1
CO - 2	Understand the Abstract Data Types and Searching and Sorting Concepts	PSO - 2	K2
CO - 3	Demonstrate the proficiency in the practical implementations and applications.	PSO - 5	K3
CO - 4	Analyze the efficiency of data structures and algorithms for solving diverse computational problems.	PSO - 4	K4
CO - 5	Evaluate the Complexity of Algorithms	PSO - 3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III			**DATA STRUCTURE AND ALGORITHMS LAB**								**Hours: 4**
Code : 23CA3CP03											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	4	3	2	5	5	4	3	3	4	3.64
CO - 2	3	4	5	3	5	3	4	5	3	3	4	3.82
CO - 3	5	4	3	4	3	4	3	4	4	3	5	3.82
CO - 4	3	5	4	4	3	3	2	3	4	5	3	3.55
CO - 5	3	3	3	5	4	3	3	3	5	3	3	3.45
Overall Mean Score												**3.66**

Result: The score for this course is **3.66** (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	4
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 -4.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF EXERCISES

1. **Stack Operations**
2. **Queue Implementation**
3. **Searching Algorithms**
   a. Linear Search
   b. Binary Search
4. **Sorting Algorithms**
   a. Selection sort
   b. Insertion Sort
   c. Merge Sort
   d. Quick Sort
5. **Linked List Programs**
   a. Singly Linked List
   b. Doubly Linked List
   c. Circular Linked List
6. **Programs using Trees**
   a. Insert an element in Binary search Tree
   b. Delete an element from Binary search Tree
   c. Search for a key element in a Binary Search Tree
7. **Programs using AVL Tree**
   a. Insertion into an AVL Tree
   b. Deletion from an AVL Tree
8. **Programs for Tree Traversal**
   a. In-order Tree Traversal
   b. Preorder Tree Traversal
   c. Post-order Tree Traversal
9. **Evaluate postfix expression using Stack**

DATABASE MANAGEMENT SYSTEM

Semester: III **Hours: 4**

Code : 23CA3AC3A **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of the fundamental concepts of Data Base System.	PSO - 1	K1
CO - 2	Understand the principles of Relational Data Model and E-R Model.	PSO - 4	K2
CO - 3	Apply the acquired skills to develop database schema considering normalization and relationships within database	PSO - 5	K3
CO - 4	Analyze the outcome of different SQL queries	PSO - 2	K4
CO - 5	Design Database operations using PL/SQL programs, Cursors and Exceptions.	PSO - 3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III			**DATABASE MANAGEMENT SYSTEM**								**Hours: 4**
Code : 23CA3AC3A											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	4	3	4	3	5	5	3	3	4	4	3.55
CO - 2	3	4	5	3	5	3	4	5	3	3	3	3.64
CO - 3	5	3	3	4	3	4	3	3	4	3	5	3.27
CO - 4	4	5	4	4	2	3	3	4	4	5	3	3.64
CO - 5	3	3	3	5	3	3	3	3	5	3	4	3.55
Overall Mean Score												**3.66**

Result: The score for this course is **3.66** (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	4
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 -4.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Database Concepts: Database Systems - Data vs Information - Introducing the database - File system - Problems with file system - Database systems. Data models - Importance - Basic Building Blocks - Business rules - Evolution of Data models - Degrees of Data Abstraction. **(12 Hours)**

UNIT II

Design Concepts: Relational database model - logical view of data - keys - Integrity rules - relational set operators - data dictionary and the system catalog - relationships - data redundancy revisited - indexes - Codd's rules. Entity relationship model - ER diagram. **(12 Hours)**

UNIT III

Normalization of Database Tables: Database tables and Normalization - The Need for Normalization - The Normalization Process - Higher level Normal Form. **Introduction to SQL:** Data Definition Commands - Data Manipulation Commands - SELECT Queries - Additional Data Definition Commands - Additional SELECT Query Keywords - Joining Database Tables. **(12 Hours)**

UNIT IV

Advanced SQL: Relational SET Operators: UNION - UNION ALL - INTERSECT - MINUS. **SQL Join Operators:** Cross Join - Natural Join - Join USING Clause - JOIN ON Clause - Outer Join. Sub Queries and Correlated Queries: WHERE - IN - HAVING - ANY and ALL - FROM. **SQL Functions:** Date and Time Function - Numeric Function - String Function - Conversion Function. **(12 Hours)**

UNIT V

PL/SQL: A Programming Language: History - Fundamentals - Block Structure - Comments - Data Types - Other Data Types - Variable Declaration - Assignment operation - Arithmetic operators. Control Structures and Embedded SQL: Control Structures - Nested Blocks-SQL in PL/SQL - Data Manipulation - Transaction Control statements.**PL/SQL Cursors and Exceptions:** Cursors - Implicit Cursors, Explicit Cursors and Attributes-Cursor FOR loops - SELECT…FOR UPDATE - WHERE CURRENT OF clause - Cursor with Parameters - Cursor Variables - Exceptions - Types of Exceptions. **(12 Hours)**

COURSE BOOKS:

1. Carlos Coronel, Steven Morris, and Peter Rob, **Database Systems, Design, Implementation and Management**, Cengage Learning, 12th Edition.

   UNIT I : Chapters: 1 (1.3, 1.4 - 1.7), 2(2.2 - 2.6)

   UNIT II : Chapters: 3 (3.1 - 3.9), 4(4.1, 4.2)

   UNIT III: Chapters: 6 (6.1 - 6.3, 6.6), 7(7.2 - 7.7)

   UNIT IV : Chapters: 8 (8.1 - 8.4, 8.8, 8.9)

2. Nilesh Shah, **Database Systems Using Oracle,** Pearson Education India, 2nd Edition, 2016.

   UNIT V: Chapters: 10 - 12

BOOKS FOR REFERENCE:

1. Abraham Silberschatz, Henry F. Kort and S. Sudarshan, **Database System Concepts**, McGraw Hill International Publication, VI Edition
2. Shio Kumar Singh, **Database Systems**, Pearson publications, II Edition.

WEB RESOURCES:

1. https://www.guru99.com/dbms-tutorial.html
2. https://beginnersbook.com/2015/04/dbms-tutorial/
3. https://www.scaler.com/topics/dbms/
4. https://www.geeksforgeeks.org/dbms/

COMPUTER GRAPHICS

Semester: III **Hours: 4**

Code : 23CA3AC3B **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain the knowledge of Graphics Systems	PSO-1	K1
CO - 2	Understand various algorithms to scan and the basic output primitives, transformations	PSO-2	K2
CO - 3	Implement the techniques of clipping, two-dimensional graphics and two-dimensional transformations.	PSO-5	K3
CO - 4	Analyze the outcome of graphics techniques and two-dimensional viewing and projections	PSO-4	K4
CO - 5	Design an application of computer animation with 3D concepts	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III				COMPUTER GRAPHICS								Hours: 4
Code : 23CA3AC3B												Credit: 4
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	4	3	4	3	2	5	5	4	3	3	4	3.64
CO - 2	3	4	5	3	5	3	4	5	3	3	3	3.73
CO - 3	5	3	3	4	3	4	3	4	3	3	5	3.64
CO - 4	3	5	4	4	3	3	2	3	4	5	3	3.55
CO - 5	3	3	3	5	4	3	3	3	5	3	3	3.45
Overall Mean Score												3.60

Result: The Score for this Course is: **3.60** (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	4
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 -4.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

A Survey of Computer Graphics: Computer Aided Design - Presentation Graphics - Computer Art - Entertainment - Education and Training - Visualization - Image Processing - Graphical User Interface. **Overview of Graphics Systems:** Video Display Devices - Raster - Scan Systems - Random - Scan Systems - Graphics Monitors and Workstations - Input Devices - Hard Copy Devices - Graphics Software. **(12 Hours)**

UNIT II

Output Primitives: Points and Lines - Line Drawing Algorithms - Loading the Frame Buffer - Line Function - Circle Generating Algorithms - Ellipse Generating Algorithms - Other Curves - Parallel Curve Algorithms - Curve Functions - Pixel Addressing - Filled Area Primitives - Fill Area Functions - Cell Array - Character Generation. **(12 Hours)**

UNIT III

Attributes of Output Primitives: Line Attributes - Curve Attributes - Color and Grayscale Levels - Area Fill Attributes - Character Attributes - Bundled Attributes - Inquiry Functions. **Two-Dimensional Geometric Transformations:** Basic Transformations - Composite Transformations - Other Transformations - Affine Transformations - Transformation Functions - Raster Methods for Transformations.

(12 Hours)

UNIT IV

Two-Dimensional Viewing: The Viewing Pipeline - Viewing Coordinate Reference Frame - Window-to-View Port Coordinate Transformation - Two-Dimensional Viewing Functions - Clipping Operations - Point Clipping - Line Clipping - Polygon Clipping - Curve Clipping - Text Clipping - Exterior Clipping.

(12 Hours)

UNIT V

Three-Dimensional Concepts: Three-Dimensional Display Methods - Three-Dimensional Graphics Packages. **Computer Animation:** Design of Animation Sequences - General Computer-Animation Functions - Raster Animations - Computer-Animation Languages - Key-Frame Systems - Motion Specifications.

(12 Hours)

COURSE BOOKS:

- Donald D. Hearn, M. Pauline Baker, **"Computer Graphics C Version**", Pearson Education, Dorling Kindersley (India) Pvt. Ltd, Second Edition, Reprint, 2018.

  UNIT I: Chapters: 1, 2

  UNIT II: Chapter: 3

  UNIT III: Chapters: 4.1 - 4.7, 5.1, 5.3, 5.4, 5.6-5.8

  UNIT IV: Chapters: 6

  UNIT V: Chapters: 9, 16

BOOKS FOR REFERENCE:

1. Hearn, Baker, **"Computer Graphics with OpenGL",** Pearson, Dorling Kindersley (India) Pvt. Ltd., Third Edition, 2013.
2. Rajesh K. Maurya, **"Computer Graphics with Virtual Reality Systems",** Wiley India Pvt. Ltd., Third Edition, 2018.

RDBMS LAB

Semester: III **Hours: 2**

Code : 23CA3AP03 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of the fundamental concepts of Data Base System.	PSO - 1	K1
CO - 2	Understand the SQL queries	PSO - 2	K2
CO - 3	Apply SQL for relational databases	PSO -5	K3
CO - 4	Analyze the outcome of different SQL queries	PSO - 4	K4
CO - 5	Design Database operations using PL/SQL programs, Cursors and Exceptions.	PSO - 3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III			**RDBMS Lab**								**Hours: 2**
Code : 23CA3AP03											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	4	3	3	5	5	4	3	3	4	3.73
CO - 2	3	4	5	3	5	3	4	5	3	4	3	3.82
CO - 3	5	4	3	4	3	4	3	4	4	3	5	3.82
CO - 4	3	5	4	4	3	3	2	3	4	5	3	3.55
CO - 4	3	3	3	5	4	3	3	3	5	3	3	3.45
Overall Mean Score												**3.67**

Result: The score for this course is **3.67** (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	4
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 -4.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF EXERCISES

1. Table Creation and Manipulation
    - DDL Commands
    - DML Commands
    - TCL Commands
2. Sub queries and Aggregate Functions
3. Implementation of different types of function with suitable examples
    - Number function
    - Aggregate Function
    - Character Function
    - Conversion Function
    - Date Function
4. Implementation of different types of operators in SQL
    - Arithmetic Operators
    - Logical Operators
    - Comparison Operator
    - Special Operator
    - Set Operation
5. Implementation of different types of Joins
    - Inner Join
    - Outer Join
    - Natural Join
6. PL/SQL programs using Built-in Exception Handling in PL/SQL
7. Program using User-defined Exceptions
8. Mark Sheet Preparation Using cursor
9. Employee Pay-Bill Preparation using Cursor
10. Program Using Trigger

ADVANCED EXCEL

Semester: III **Hour: 1**

Code : 23SE3CA03 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the basic knowledge and skills to use MS Excel	PSO-1	K1
CO-2	Understand the syntax and usage of various formulas in Excel	PSO-2	K2
CO-3	Implement statistical functions, data filtering and sorting concepts for different purpose.	PSO-5	K3
CO-4	Analyze the lookups and financial functions	PSO-4	K4
CO- 5	Create and evaluate different types of Charts and Graphical Representation of Data	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III			**ADVANCED EXCEL**						**Hours: 1**			
Code : 23SE3CA03												**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	4	3	3	5	5	4	3	3	4	3.73
CO - 2	3	4	5	3	5	3	4	5	3	4	3	3.82
CO - 3	5	4	3	4	3	4	3	4	4	3	5	3.82
CO - 4	3	5	4	4	3	3	2	3	4	5	3	3.55
CO - 5	2	3	3	5	3	3	3	3	5	3	3	3.27
Overall Mean Score												**3.64**

Result: The score for this course is **3.64** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

LIST OF EXERCISES

1. Implement Date & Time functions
2. Implement Text functions
3. Implement Database functions.
4. Demonstrate Statistical functions in MS Excel
5. Demonstrate financial functions using MS Excel
6. Implement lookups in Excel
7. Create a spreadsheet to apply sorting, data filtering and data validating
8. Prepare a spreadsheet for the Marksheet of 10 students using logical and conditional functions and Create a Pie Chart to represent the data.
9. Create a worksheet for Pay-Bill Preparation
10. Create an Excel Worksheet for the monthly sales of a product and also represent the data using bar chart.
11. Import a CSV file in excel and apply some basic data analytical functions
12. Apply conditional formatting for CSV files

ANIMATION LAB

Semester: III **Hours: 2**

Code : 23CA3GE01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the skills of using the drawing tools	PSO-1	K1
CO - 2	Understand the different types of Animation	PSO - 4	K2
CO - 3	Use the drawing and animation skills to create effective animations	PSO - 5	K3
CO - 4	Analyze the different types of animation and their suitability in real-time scenarios	PSO - 2	K4
CO -5	Create short story with animation and sound effects	PSO - 3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III			**ANIMATION LAB**								**Hours: 2**
Code : 23CA3GE01											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	4	3	4	3	5	5	3	3	4	3	3.64
CO - 2	3	4	5	3	5	3	4	5	3	3	3	3.73
CO - 3	5	3	3	4	3	4	3	3	4	3	5	3.64
CO - 4	3	5	3	3	2	3	3	4	3	5	3	3.36
CO -5	3	3	3	5	3	3	3	3	5	3	4	3.45
Overall Mean Score												**3.56**

Result: The score for this course is **3.56** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF EXERCISES

1. Drawing Objects using Tools
2. Frame-by-Frame Animation
3. Classic Tween Animation
4. Motion Tween Animation
5. Shape Tween Animation
6. Multilayer Animation
7. Guide Layer Animation
8. Mask Layer Animation
9. Animation using Sound Effects
10. Animation Using Buttons
11. Short Story Creation with Animation and Sound Effects

PART IV - NATIONAL CADET CORPS

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Think critically, evaluate analytically and apply the acquired knowledge of their discipline in related scenario.
2.	Formulate hypothesis, design experiments, use appropriate tools and interpret the results.
3.	Demonstrate the precise understanding of the principles and theories of their discipline through experiments.
4.	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
5.	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities.
6.	Increase self-awareness, set and pursue meaningful goals, and develop positive personal qualities.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO. NO.	UPON COMPLETION OF THE COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
1	Reinforce the aims, motto, vision and mission of the NCC through the academic curriculum.	PO-1
2	Train the students, to be graduates with all round development, who apart from their own subject, can successfully compete in other fields such as defense/paramilitary/ police forces and civil services.	PO-4
3	Perform in social service activities and creating awareness about social evils in society.	PO-5
4	Explain the tri services organization, comprising the army, navy and air force, engaged in grooming the youth of the country into disciplined and patriotic citizens.	PO-3, PO-6
5	Demonstrate "B" and "C" certificate examination of NCC helps in getting jobs in different forces and also security related jobs.	PO-2

GE - 1: NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT

Semester: III **Hours: 2**
Code : 23GE3NC01 **Credit: 2**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Develop technical skill in Civil defense and self-defense in order to safeguard the society in case of need arises	PSO - 2	K1
CO - 2	Perceive the importance of Weapon training is to remove the fear of a weapon from the hearts of youth.	PSO - 3	K2
CO - 3	Comprehend the motivation for positive attitude, character building and personality development.	PSO - 5	K3
CO - 4	Analyze the different types of disasters under different circumstances.	PSO - 4	K4
CO - 5	Achieve practical knowledge in community development and other social programmes.	PSO - 1	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III				GE-1: NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT							Hours: 2
Code : 23GE3NC01											Credit: 2
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	3	2	4	5	4	4	3	5	4	4	2	3.63
CO - 2	2	3	3	2	5	3	2	2	5	3	3	3.00
CO - 3	3	5	4	3	3	4	3	3	3	4	5	3.63
CO - 4	2	3	5	4	3	5	2	4	3	5	3	3.54
CO - 5	5	2	3	3	2	3	5	3	2	3	2	3.00
Overall Mean Score												3.36

Result: The Score for this Course is **3.36** (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

GE-1: NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT

2hrs/Week

UNIT I

National Integration **6 Hours**

Motto of National Integration - Importance of National Integration Culture and heritage of Tamil Nadu.

UNIT II

Civil Affairs **6 Hours**

Aim of aid to civil authority - Role of NCC Cadets during natural calamities - Types of disaster - Essential services during natural calamities

UNIT III

Civil Defence and Self Defence **6 Hours**

Civil Defence - Organization - Aims and services- Aid to Civil authorities in emergency- Self Defence -Aims of Self Defence - Women and Self Defence

UNI IV

Leadership And Personality Development **6 Hours**

Leadership - Types and traits - Man Management in NCC - Duties of a Good Citizen - Role of Youth in Nation Building - Morale - Factors which affect morale - Factors which develop high morale Personality Development - Factor influencing Personality-Time Management .

UNIT V

Soft Skills **6 Hours**

Soft skills - interview skill - influencing skill - social skill - communication skill - self motivation - self-esteem - body language.

INTERNAL QUESTION PATTERN (Fully Internal Papers) - UG (2023-2026)

Max. Marks - 40 **Duration - $1\frac{1}{2}$ Hours**

Section	Bloom's level	Course Outcome	Questions
A MCQs (10×1=10)	K1	CO1	1.
		CO1	2.
		CO1	3.
		CO1	4.
		CO1	5.
		CO1	6.
		CO1	7.
		CO1	8.
		CO1	9.
		CO1	10.
B Answer all the Questions (2×5=10)	K2	CO2	11. a) (or) 11. b)
	K3	CO3	12. a) (or) 12. b)
C Answer all the questions (2×10=20)	K4	CO4	13. a) (or) 13. b)
	K5	CO5	14. a) (or) 14. b)

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - 2023-2026

Component	Marks
Internal test I	40
Internal test II	40
Seminar/ Quiz	10
Assignment	5
Attendance	5
Total	**100**

ABILITY ENHANCEMENT COURSE-3 (AEC-3)

ENVIRONMENTAL STUDIES

PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Endow with in-depth knowledge, analyze and apply the understanding of their discipline for the betterment of self and society.
2.	Synthesize ideas form various disciplines, enhance the inter disciplinary knowledge and extend it for research.
3.	Gain confidence and skills to communicate orally/verbally in research platforms and state a clear research finding.
4.	Develop problem-solving and computational skills and gain confidence to appear for the competitive examinations.
5.	Enhance knowledge regarding research by accumulating practical knowledge in specific areas of research.
6.	Achieve idealistic goals and enrich the values to tackle the societal challenges.

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Assess the scope and importance of environmental studies and the need for public awareness.	PO-1
2.	Develop a deeper understanding in the classification of resources.	PO-2
3.	Analyze the concept of the ecosystem.	PO-3
4.	Comprehend the definitions, causes and control measures of environmental pollutions.	PO-4,
5.	Participate in the environmental issues programmes from the unsustainable to sustainable development.	PO-5, PO-6

AEC-3 ENVIRONMENTAL STUDIES

Semester: III **Hours: 2**

Code : 23AE3ES03 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand natural resources, ecosystems, environmental pollution and social issues	PSO-1	K1
CO - 2	Explain different types of natural resources, pollution, ecosystem and social issues	PSO-2	K2
CO - 3	Demonstrate the identification, utilization, ecosystems and the impact of environmental pollution on both the natural world and human communities and the conservation of natural resources	PSO-3	K3
CO - 4	Analyse social issues related to environmental sustainability	PSO-4	K4
CO - 5	Examine societal concerns within and surrounding the Theni District	PSO-5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: III				AEC-3 ENVIRONMENTAL STUDIES								Hours: 2
Code : 23AE3ES03												Credit: 2
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	3	3	3	3	3	5	3	3	3	3	3.36
CO - 2	3	5	4	4	3	3	3	5	4	4	3	3.73
CO - 3	3	3	5	3	4	4	3	3	5	3	4	3.64
CO - 4	3	3	3	5	4	4	3	3	3	5	4	3.64
CO - 5	3	3	3	4	5	5	3	3	3	4	5	3.73
Overall Mean Score												3.62

Result: The score for this course is **3.62** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I: NATURAL RESOURCES

Multidisciplinary nature of environmental studies: Definition, scope and importance - need for public awareness - classification of resources: renewable and non - renewable resources, forest resources, water resources, mineral resources, food resources, energy resources, land resources - associated problems; role on an individual in conservation of natural resources - equitable use of sources for sustainable lifestyles. **(6 Hours)**

UNIT II: ECOSYSTEMS

Concept, structure and function of an ecosystem - energy flow in the ecosystem - food chains, food webs and ecological pyramids - Types, characteristic features, structure and function of Forest, grassland, desert and aquatic ecosystem.

(6 Hours)

UNIT III: ENVIRONMENTAL POLLUTION

Definition - causes - effects and control measures of air pollution, water pollution,soil pollution, marine pollution, noise pollution, thermal pollution, nuclear hazards, solid waste management, the role of an individual in prevention of pollution. **(6 Hours)**

UNIT IV: SOCIAL ISSUES AND THE ENVIRONMENTS

From unsustainable to sustainable development - urban problems related to energy water conservation, rainwater harvesting, watershed management, resettlement and rehabilitation of people, its problem and concerns, case studies, environmental ethics, climate change, global warming, acid rain and ozone layer depletion, nuclear accidents and holocaust, case studies. Wasteland reclamation. Environmental protection act, air act, water act and wildlife protection. **(6 Hours)**

UNIT V: BIODIVERSITY IN THENI DISTRICT

Water resources, climate and soil types - Ecosystems: flora and fauna, the impact of human activities on the ecosystem - environmental pollution: identification of pollution sources and pollution control measures.

FIELDWORK

Visit to Kodaikanal for documentation of environmental assets- river/forest/ grassland/hill/mountain/cholas. **(6 Hours)**

COURSE BOOK:

- Murugeshan, R., (2007). Environmental Science and Engineering, Milleniumpublication, Madurai.

UNIT I : Section - 1.3 to 1.37

UNIT II : Section - 2.1 to 2.7 & 2.10 to 2.27

UNIT III : Section - 3.1 to 3.37

UNIT IV : Section - 4.1 to 4.17

UNIT V : https://en.wikipedia.org/wiki/Theni_district

https://nwm.gov.in/sites/default/files/Notes%20on%20Theni%20District_.pdf

https://tnmines.tn.gov.in/pdf/dsr/23.pdf

Note:

(i) Tamil Version for Tamil Literature and History Tamil Medium Students

(ii) UNIT-V materials prepared by Staff

Continuous Internal Assessment Component (CIA)

Theory:

Component	**Marks**
Internal test I	40
Internal test II	40
Field Visit	10
Field Visit Report	5
Attendance	5
Total	**100**

Continuous Internal Assessment Component (CIA)

Passing Minimum: 40% out of 100

Internal Question Pattern

Part - A

10 Questions × 1Mark =10 Marks

Part - B

2 Questions × 5 Marks = 10 Marks (Internal Choice)

Part - C

2 Questions × 10 Marks = 20 Marks (2 Questions out of 3)

(Open Choice and at least one Question from allotted Units)

பொதுத் தமிழ் - 4

(பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: நான்கு **நேரம்: 6**

குறியீடு: 23GT4GS04 **புள்ளி: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	சங்க இலக்கியத்தில் காணப் பெறும் வாழ்வியல் சிந்தனைகளை அறிந்து கொள்வர்.	PSO-2	K1
CO - 2	தமிழின் தொன்மையையும் செம்மொழித் தகுதியையும் அறிவர்.	PSO-1	K2
CO - 3	நாடக இலக்கியம் மூலம் நடிப்பாற்றலையும், கலைத் தன்மையையும், படைப்பாற்றலையும் வளர்த்தல்.	PSO-3	K3
CO - 4	தமிழிலிருந்து அலுவலகக் கடிதங்களை மொழிபெயர்க்கும் அறிவைப் பெறுவர்.	PSO-4	K4
CO - 5	மொழியறிவோடு வேலை வாய்ப்பினைப் பெறுதல்.	PSO-5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV				பொதுத்தமிழ் - 4 (பிற துறை மாணவிகளுக்கு மட்டும்)							**Hours: 6**
Code : 23GT4GS04											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	3	4	5	5	3	5	3	4	4	3.91
CO - 2	4	5	3	3	3	3	5	3	3	4	3	3.55
CO - 3	3	3	5	4	4	4	3	4	5	3	4	3.82
CO- 4	5	3	3	3	4	4	3	4	3	5	3	3.64
CO - 5	3	3	3	5	4	4	3	4	3	3	5	3.64
Overall Mean Score												**3.71**

Result: The score for this course is **3.71** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

அலகு 1: எட்டுத் தொகை

நற்றிணை - (10, 14, 16), குறுந்தொகை - (16, 17, 19, 20, 25, 29), கலித்தொகை - (38, 51), அகநானூறு - (15, 33, 55), புறநானூறு - (37, 86, 112), பரிபாடல் - வையை, இருபத்திரண்டாம் பாடல், ஒளிறுவாள் பொருப்பன் உடல் சமத் திறுத்த) **18 Hours**

அலகு 2: பத்துப் பாட்டு

நெடுநல்வாடை - நக்கீரர் **18 Hours**

அலகு 3: நாடகம்

சபாபதி - பம்மல் சம்பந்த முதலியார் **18 Hours**

அலகு 4: இலக்கிய வரலாறு

பாடம் தழுவிய இலக்கிய வரலாறு **18 Hours**

அலகு 5: மொழித்திறன்

மொழிபெயர்ப்பு / கலைச்சொற்கள்

கொடுக்கப்பட்டுள்ள ஆங்கிலப் பகுதியைத் தமிழில் மொழிபெயர்த்தல்.

அலுவலகக் கடிதம் - தமிழில் மொழிபெயர்த்தல். **18 Hours**

பாட நூல்கள்

1. தமிழ்த்துறை வெளியீடு (தொகுப்பு), - பொதுத்தமிழ் - 4, ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி (தன்னாட்சி), பெரியகுளம்.
2. சங்க இலக்கியம், எட்டுத்தொகை, - எம். நாராயண வேலுப்பிள்ளை, நர்மதா பதிப்பகம், முதற்பதிப்பு -2011.
3. பத்துப் பாட்டு, மூலமும் உரையும், - திருநெல்வேலி தென்னிந்திய சைவ சிந்தாந்த நூற்பதிப்புக் கழகம், சென்னை 18, முதற்பதிப்பு - 2007.
4. பம்மல் சம்பந்த முதலியார் அவர்களின் சபாபதி நாடகம், அருட்பெருஞ்சோதி அச்சகம், சென்னை -1.
5. சிற்பி. பாலசுப்பிரமணியன். - தமிழ் இலக்கிய வரலாறு,

பார்வை நூல்கள்

1. புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழண்ணல்.
2. வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, எ.ஃப். பாக்கியமேரி.

General Essay, Translation and Letter Writing, Alankar

Semester: IV **Hours: 5**

Code : 23GH4GS04 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Learn the Development of Hindi Translation	PSO-1	K1
CO - 2	Learning to be United Across Religions.	PSO-4	K2
CO - 3	Improve Personal and Official letter writing skills.	PSO-2	K3
CO - 4	Analytical Creativity will be Developed.	PSO-3	K4
CO - 5	Ability to Beautiful words with Syllables and Phrases.	PSO-5	K5

UNIT I **(15 Hours)**

- Anushashan
- Anuvad Abyas - III (1-2 Lessons) English to Hindi, Hindi to English
- Avedan Patra

UNIT II **(15 Hours)**

- Pariksham Ka Mahatva
- Anuvad Abyas - III (3-4 Lessons) English to Hindi, Hindi to English
- Sampathak ke naam Patra

UNIT III **(15 Hours)**

- Paropakar
- Anuvad Abyas - III (5 Lessons) English to Hindi, Hindi to English
- Ras Short Notes -(Shringar, Hasya, Veer, Karun, Raudra)

UNIT IV **(15 Hours)**

- Bhavaathmak Ekta
- Paarivarik Patra
- Chand Short Notes - (Doha, Sorta, Geethika, Rola, Hari Geethika)

UNIT V **(15 Hours)**

- Nari Ka Karthavya Aur Adhikaar
- Thuranth Patra
- Alankar -(Anupras, Yamak, Vakrokthi, Upama, Virodabhas)

COURSE BOOKS:

1. Nibandh Praveshika, Dakshina Bhaaratha Hindi Prachar Sabha, T. Nagar, Chennai-600017.

The follo wing Sahityotar (General) essay have been prescribed

- ❖ Anushashan
- ❖ Pariksham Ka Mahatva
- ❖ Paropkar
- ❖ Bhavathmak Ekta
- ❖ Nari Ka Karthavya Aur Adhikaar

2. Translation: Anuvad Abyas -III(1-5 Lessons) English to Hindi, Hindi to English Published by Dakshina Bharath Hindi Prachar Sabha, Thyagaraya Nagar, Chennai - 600017.
3. Alankar: Kavya Shashthra Published by Dakshina Bharath Hindi Prachar Sabha, Thyagaraya Nagar, Chennai - 600 017.

The following Alankar have been prescribed

- ❖ Ras- Short Notes -(Shringar, Hasya, Veer, Karun, Raudra
- ❖ Alankar -(Anupras, Yamak, Vakrokthi, Upama, Virodabhas)
- ❖ Chand Short Notes - (Doha, Sorta, Geethika, Rola, Hari Geethika

BOOKS FOR REFERENCE:

1. Letter Writing: Pramanik Alekan Aur Tippan Prof Viraj M.A. Kashmirgate, Delhi - 110006

The following topics have been prescribed

- ❖ Paarivarik Patra
- ❖ Avedan Patra
- ❖ Sampathak ke naam Patra
- ❖ Thuranth Patra

COMMUNICATIVE ENGLISH - IV

Semester: IV **Hours: 4**

Code : 23GE4GS04 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recognize the literary genres through various literary works	PSO-5	K1
CO - 2	Compare the social norms of other cultures	PSO-3	K2
CO - 3	Apply the language skills through literature	PSO-2	K3
CO - 4	Connect the ideas provided in the text	PSO-4	K4
CO - 5	Prioritize their communication skills along with literature	PSO-1	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV				**COMMUNICATIVE ENGLISH - IV**							**Hours: 4**
Code : 23GE4GS04											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	5	4	4	4	5	4	4	4	4	5	4.27
CO - 2	3	3	5	4	3	3	3	4	5	3	3	3.55
CO - 3	4	3	3	5	3	3	4	5	3	3	3	3.55
CO - 4	4	4	3	4	5	4	4	4	3	5	4	4.00
CO - 5	5	4	4	4	3	4	5	4	4	3	4	4.00
Overall Mean Score												**3.87**

Result: The score for this course is **3.87** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I: POETRY **12 Hours**

Dahlia Ravikovitch - "Pride"

Maya Angelou - "Phenomenal Woman"

William Wordsworth - " The Tables Turned"

UNIT II: LIFE STORY **12 Hours**

Adeline Yen Mah - From *Chinese Cinderella*

George Orwell - "Why I Write"

UNIT III: SHORT STORY **12 Hours**

O Henry - "A Retrieved Reformation"

Extract from a play

The Quality of Mercy (Trial Scene from *The Merchant of Venice* -

Shakespeare: Act IV- Scene 1-(1 to 163 lines)

UNIT IV: GRAMMAR **12 Hours**

Types of Sentences

Question Tags

UNIT V: DRAFTING **12 Hours**

Reading Comprehension

Book Review

Product Review

Resume Writing

COURSE BOOKS

- Course Materials will be provided by the Department of English.
- Savarimuttu, Rohan J. S, and G. Petricia Alphine Nirmala, *English Grammar and Usage - An Ideal Companion for Advanced Learners*. New Century Book House (P) Ltd, 2016.

BOOKS FOR REFERENCE

1. Orwell, George. *Why I Write.* Gangrel-GB, London, 1946.
2. Green, David. *Contemporary English Grammar: Structures and Composition*. Macmillan India Limited, Chennai, 1981.
3. Shakespeare, William. *The Merchant of Venice*, Peacock. 2014.

WEB SOURCES:

1. https://www.google.co.in/books/edition/Chinese-Cinderella-and-the-Secret-Drag on/JUqCzR5GTdQC?hl=en&gbpv=1&pg=PT3&printsec=frontcover
2. https://orwell.ru/library/essays/wiw/english/e-wiw
3. https://srjcstaff.santarosa.edu/~mheydon/whywriteD.pdf(correct
4. http://www.blupete.com/Literature/Essays/Hazlitt/RoundTable/LoveLife.htm
5. https://www.poetryinternational.com/en/poets-poems/poems/poem/103-3359-PRIDE

PROGRAMMING IN JAVA

Semester: IV **Hours: 4**

Code : 23CA4MC05 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the knowledge of Object-Oriented Programming concepts.	PSO-1	K1
CO-2	Understand the Core Java fundamentals.	PSO-4	K2
CO-3	Apply the Java Programming skills to solve real-world problems.	PSO-5	K3
CO-4	Analyze the concepts of Inheritance, Interface, Modularity and Exception handling to develop java program.	PSO-2	K4
CO-5	Evaluate swing, event driven GUI and web related applications which mimic the real-world scenarios.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV				**PROGRAMMING IN JAVA**							**Hours: 4**
Code : 23CA4MC05											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	4	3	4	3	5	5	4	3	4	3	3.73
CO-2	4	4	5	3	5	3	4	5	3	4	3	3.91
CO-3	5	4	3	4	3	4	3	4	4	3	5	3.82
CO-4	3	5	4	3	4	3	3	4	3	5	3	3.64
CO-5	4	3	3	5	3	3	4	3	5	3	4	3.64
Overall Mean Score												**3.75**

Result: The score for this course is **3.75** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Fundamentals of Object-Oriented Programming: Object- Oriented Paradigm - Basic Concepts of Object - Oriented Programming - Benefits of OOP - Applications of OOP**. Overview of Java Language:** Simple Java Program - More of Java - An Application with Two Classes - Java Program Structure - Java Tokens - Java Statements - Implementing a Java Program - Java Virtual Machine - Command Line Arguments - Programming Style. **Constants, Variables and Data Types:** Constants - Variables - Data Types - Declaration of Variables - Giving Values to Variables - Scope of Variables - Symbolic Constants - Type Casting - Getting Values of Variables - Standard Default Values. **(12 Hours)**

UNIT II

Operators and Expressions: Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators - Increment and Decrement Operators - Conditional Operator - Bitwise Operators - Special Operators - Arithmetic Expressions - Evaluation of Expressions - Precedence of Arithmetic Operators - Type Conversions in Expressions - Operator Precedence and Associativity - Mathematical Functions. **Decision Making and Branching:** Decision Making with If Statement - Simple If Statement - The If...Else Statement - Nesting of If…Else Statement - The Else If Ladder - The Switch Statement - The ?: Operator. **Decision Making and Looping:** While Statement - Do Statement - For Statement - Jumps in Loops - Labelled Loops.

(12 Hours)

UNIT III

Classes, Objects and Methods: Defining a Class - Fields Declaration - Methods Declaration - Creating Objects - Accessing Class Members - Constructors - Methods Overloading - Static Members - Nesting of Methods - Inheritance: Extending a class - Overriding Methods - Final Variables and Methods - Final Classes - Finalizer Methods - Abstract Methods and Classes - Methods with Varargs - Visibility Control. **Arrays, Strings and Vectors:** One-dimensional Arrays - Creating an Array - Two-dimensional Arrays - Strings - Vectors - Wrapper Classes - Enumerated Types - Annotations. **Interfaces: Multiple Inheritance:** Defining Interfaces - Extending Interfaces - Implementing Interfaces - Accessing Interface Variables. **(12 Hours)**

UNIT IV

Packages: Putting Classes Together: Java API Packages - Using System Packages - Naming Conventions - Creating Packages - Accessing a Package - Using a Package - Adding a Class to a Package - Hiding Classes - Static Import. **Multithreaded Programming:** Creating Threads - Extending the Thread Class - Stopping and Blocking a Thread - Life Cycle of a Thread - Using Thread Methods - Thread Exceptions - Thread Priority - Synchronization - Implementing the Runnable Interface - Inter-Thread Communication. **Managing Errors and Exceptions:** Types of Errors - Exceptions - Syntax of Exception Handling Code - Multiple Catch Statements - Using Finally Statement - Throwing Our Own Exceptions - Improved Exception Handling in Java SE 7 - Using Exceptions for Debugging. **(12 Hours)**

UNIT V

Applet Programming: How Applets Differ from Applications - Preparing to write Applets - Building Applet Code - Applet Life Cycle - Creating an Executable Applet - Designing a Web Page - Applet Tag - Adding Applet to HTML File - Running the Applet - More About Applet Tag - Passing Parameters to Applets - Aligning the Displaying - More about HTML Tags - Displaying Numerical Values - Getting Input from the User - Event Handling. **Managing Input/Output Files in Java:** Concept of Streams - Stream Classes - Byte Stream Classes - Character Stream Classes - Using Streams - Other Useful I/O Classes - Using the File Class - Input/Output Exceptions - Creation of Files - Reading/Writing Characters - Reading/Writing Bytes - Handling Primitive Data Types - Concatenating and Buffering Files - Random Access Files - Interactive Input and output - Other Stream classes. **Java Collections:** Overview of Interfaces - Overview of classes - Overview of Algorithms. **(12 Hours)**

COURSE BOOK:

- E. Balagurusamy, "**Programming with JAVA A Primer**", Tata McGraw Hill Education (India) Private Limited, New Delhi, Fifth Edition, 2016.

  UNIT I: Chapters: 1, 3, 4

  UNIT II: Chapters: 5, 6, 7

  UNIT III: Chapters: 8, 9, 10

  UNIT IV: Chapters: 11, 12, 13

  UNIT V: Chapters: 14, 16, 18

BOOKS FOR REFERENCE:

1. Herbert Schildt, **"Java-The Complete Reference"**, Tata McGraw Hill, New Delhi, 9th Edition, 2014.
2. Gary Cornell, **"Core Java 2 Volume I-Fundamentals",** Addison Wesley,1999
3. Y. Daniel Liang, **Introduction to Java Programming***,* 7th Edition, Pearson Education India, 2010.

WEB RESOURCES:

1. https://javabeginnerstutorial.com/core-java-tutorial
2. http://docs.oracle.com/javase/tutorial/
3. https://www.javatpoint.com/java-tutorial

PROGRAMMING IN JAVA LAB

Semester: IV **Hours: 4**

Code : 23CA4CP04 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the knowledge of Object-Oriented Programming concepts.	PSO-1	K1
CO-2	Understand the Core Java fundamentals.	PSO-4	K2
CO-3	Apply the Java Programming skills to solve real-world problems.	PSO-5	K3
CO-4	Analyze the concepts of Inheritance, Interface, Modularity and Exception handling to develop java program.	PSO-2	K4
CO-5	Evaluate swing, event driven GUI and web related applications which mimic the real-world scenarios.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV			**PROGRAMMING IN JAVA LAB**								**Hours: 4**
Code : 23CA4CP04											**Credits:3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**				**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	4	3	4	3	5	5	4	3	4	3	3.73
CO-2	4	4	5	3	5	3	4	5	3	4	3	3.91
CO-3	5	4	3	4	2	4	3	4	4	3	5	3.73
CO-4	3	5	4	3	4	4	3	4	3	5	3	3.73
CO-5	4	3	4	5	3	3	4	3	5	3	4	3.73
Overall Mean Score												**3.77**

Result: The score for this course is **3.77** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF EXERCISES

1. Simple Programs

a. Number Checking (Prime, Perfect, Palindrome)

b. Number Generation (Prime, Perfect, Palindrome, Fibonacci)

2. Arrays and control structures

a. Number Sorting and Searching

b. Matrix Manipulation (Addition, Multiplication, Transpose)

3. Constructors and Method overloading

a. Complex Number operation using constructors

b. Area of different shapes using method overloading

4. String Methods

a. String Sorting and Searching

b. Program using string methods

5. Inheritance

a. Mark Sheet Processing

b. Electricity Bill Preparation

6. Package & Interface

a. Bank transaction

b. Employee Details using Interface

7. Exception Handling and Threads

a. Built-in Exceptions

b. User-defined Exceptions

c. Program using Multithreading

8. Program using Files

a. Counting no of lines, words and characters in a file

b. CIA record preparation for 'n' students.

9. Programs using Applets, AWT and Collections

a. Drawing Objects

b. Simple Calculator

c. Simple program using collections

DATAMINING AND WAREHOUSING

Semester: IV **Hours: 4**

Code : 23CA4AC4A **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the fundamental knowledge of Data mining concepts and techniques.	PSO-1	K1
CO-2	Understand the different phases of Data Mining.	PSO-2	K2
CO-3	Apply the appropriate algorithms to solve Data Mining Problems	PSO-5	K3
CO-4	Analyze the results of different Data Mining Algorithms	PSO-4	K4
CO-5	Evaluate the performance of the Data Mining Techniques with real world data	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV			**DATA MINING AND WAREHOUSING**								**Hours: 4**
Code : 23CA4AC4A											**Credit:4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	4	3	3	5	5	4	3	3	4	3.64
CO-2	3	4	5	3	5	3	4	5	3	4	3	3.45
CO-3	5	4	3	4	3	4	3	4	4	3	5	3.73
CO-4	3	5	4	4	3	3	3	3	4	5	3	3.55
CO-5	3	4	3	5	3	3	4	3	5	3	3	3.91
Overall Mean Score												**3.71**

Result: The score for this course is **3.71** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction: Data Mining- Definition - Kinds of Data Mined -Kinds of Patterns Mined - Technologies Used -Kinds of Applications Targeted - Major Issues in Data Mining. **Getting to Know Your Data:** Data Objects and Attribute Types - Basic Statistical Descriptions of Data - Data Visualization - Measuring Data Similarity and Dissimilarity. **(12 Hours)**

UNIT II

Data Preprocessing: An Overview - Data Cleaning - Data Integration -Data Reduction- Data Transformation and Data Discretization. **Data Warehousing and Online Analytical Processing:** Data Warehouse: Basic Concepts - Data Warehouse Modeling: Data Cube and OLAP - Data Warehouse Design and Usage.

(12 Hours)

UNIT III

Mining Frequent Patterns, Association and Correlations: Basic Concepts and Methods: Basic Concepts - Frequent Item Set Mining Methods - Patterns Interesting -Pattern Evaluation Methods. **Advanced Pattern Mining:** Pattern Mining in Multilevel, Multidimensional Space. **(12 Hours)**

UNIT IV

Classification: Basic Concepts: Basic Concepts - Decision Tree Induction - Bayes Classification Methods - Rule-Based Classification. **Classification: Advanced Methods:** Classification by Backpropagation - Support Vector Machines.

(12 Hours)

UNIT V

Cluster Analysis: Basic Concepts and Methods: Cluster Analysis - Partitioning Methods - Hierarchical Methods - Density-Based Methods. **Outlier Detection:** Outlier and Outlier Analysis - Outlier Detection Methods - Statistical Approaches. **Data Mining Trends and Research Frontiers:** Data Mining Applications- Data Mining and Society- Data Mining Trends. **(12 Hours)**

COURSE BOOK:

- Jiawei Han, Micheline Kamber, **"Data Mining Concepts and Techniques"**, Morgan Kaufmann Publishers, III Edition, 2012.

  UNIT I: Chapters: 1, 2

  UNIT II: Chapters: 3, 4.1 - 4.3

  UNIT III: Chapters: 6, 7.2

  UNIT IV: Chapters: 8.1-8.4, 9.1-9.3

  UNIT V: Chapters: 10.1- 10.4, 12.1-12.3, 13.3-13.5

BOOKS FOR REFERENCE:

1. Ian H. Witten & Eibe Frank, "**Data Mining - Practical Machine Learning Tools and Techniques**", Morgan Kaufmann Publishers, III Edition, 2014.
2. Arun K. Pujari, "**Introduction to Data Mining Techniques**", University Press, II Edition, 2013.

WEB RESOURCES:

1. https://www.topcoder.com/thrive/articles/data-warehousing-and-data-mining
2. https://www.javatpoint.com/data-mining-cluster-vs-data-warehousing
3. https://www.tutorialspoint.com/Data-Warehousing-and-Data-Mining

BIG DATA ANALYTICS

Semester: IV **Hours: 4**

Code : 23CA4AC4B **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the basic knowledge of Big Data Analytics	PSO-1	K1
CO-2	Understand the skills to store and retrieve big data in databases and data warehouses	PSO-2	K2
CO-3	Apply the Big data analytical tool on voluminous data	PSO-5	K3
CO-4	Evaluate various analytical tools and their historical development	PSO-4	K4
CO-5	Develop analytical models for social media analytics and opinion mining on tweets	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV				**BIG DATA ANALYTICS**							**Hours: 4**
Code : 23CA4AC4B											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	3	4	3	3	5	5	4	3	3	4	3.64
CO-2	3	4	5	3	5	3	4	5	3	4	3	3.82
CO-3	5	3	3	4	3	4	3	4	4	3	5	3.73
CO-4	3	5	4	3	3	3	3	3	4	5	3	3.55
CO-5	3	4	3	5	3	3	4	3	5	3	3	3.55
Overall Mean Score												**3.66**

Result: The score for this course is **3.66** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Getting an Overview of Big Data: Big Data Definition-History of Data Management - Evolution of Big Data-Structuring Big Data- Elements of Big Data- Big Data Analytics- Careers in Big Data- Future of Big Data. **Exploring the use of Big Data in Business Context:** Use of Big Data in Social Networking - Use of Big Data in Preventing Fraudulent Activities - Use of Big Data in Detecting Fraudulent Activities in Insurance Sector - Use of Big Data in Retail Industry. **Introducing Technologies for Handling Big Data:** Distributed and Parallel computing for Big Data - Introducing Hadoop - Cloud computing and Big Data - In Memory Computing Technology for Big Data. **(12 Hours)**

UNIT II

Understanding Big Data Technology Foundations: Exploring the Big Data Stack - Virtualization and Big Data - Virtualization Approaches. **Storing Data in Databases and Data Warehouses:** RDBMS and Big Data - Non- Relational Database - Polyglot Persistence - Integrating Big Data with Traditional Data Warehouses - Big Data Analysis and Data Warehouse - Changing Deployment Models in Big Data Era. **NoSQL Data Management:** Introduction to NoSQL- Types of NoSQL Data Models-Schema-Less Databases-Materialized Views-Distribution Models. **(12 Hours)**

UNIT III

Understanding Analytics and Big Data: Comparing Reporting and Analysis - Types of Analytics - Points to Consider during Analysis - Developing an Analytic Team - Understanding Text Analytics. **Analytical Approaches and Tools to Analyze Data:** Analytical Approaches - History of Analytical Tools - Introducing Popular Analytical Tools - Comparing Various Analytical Tools - Installing R - Installing R Studio. **(12 Hours)**

UNIT IV

Working with Functions and Packages in R: Using Functions instead of Scripts - Using Arguments in Functions - Built-in Functions in R - Introducing Packages - Working with Packages. Performing Graphical Analysis in R: Using Plots - Saving Graphics to External files - Advanced features of R. **Data Visualization-I**: Ways of Representing Visual Data- Techniques Used for Visual Data Representation- Types of Data Visualization -Applications of Data Visualization-Visualizing Big Data- Tools Used in Data Visualization- Tableau Products. **Data Visualization with Tableau (Data Visualization-II):** Introduction to Tableau Software-Tableau Desktop Workspace- Data Analytics in Tableau Public- Using Visual Controls in Tableau Public-Overview of Tableau. **(12 Hours)**

UNIT V

Social Media Analytics and Text Mining: Introducing social media - Introducing Key Elements of social media - Introducing Text Mining - Understanding Text Mining Process - Sentiment Analysis - Performing Social Media Analytics and Opinion Mining on Tweets. **Mobile Analytics:** Introducing Mobile Analytics - Introducing Mobile Analytics Tools - Performing Mobile Analytics - Challenges of Mobile Analytics. **(12 Hours)**

COURSE BOOK:

- DT Editorial Services, **"Big Data Black Book",** DreamTech Press, 2017.

  UNIT I: Chapters: 1, 2, 3

  UNIT II: Chapters: 6, 7, 15

  UNIT III: Chapters: 18, 19

  UNIT IV: Chapters: 23, 26, 27

  UNIT V: Chapters: 28, 29

BOOKS FOR REFERENCE:

1. Soumendra Mohanty, Madhu Jagadeesh, Harsha Srivatsa, **"Big Data Imperatives",** APress, First Indian Reprint, 2013.
2. Thomas Erl, Wajid Khattak, Paul Buhler, "**Big Data Fundamentals"**, Pearson Education, First Impression, 2016.

WEB RESOURCES:

1. https://www.udemy.com/course/big-data-complete-course/
2. https://www.udemy.com/courses/search/?q=big+data+analytics&src=sac&kw=big+data+analytics
3. https://www.udemy.com/course/python-big-data-analytics-and-data-science/

PHP PROGRAMMING

Semester: IV **Hours: 2**

Code : 23CA4AP04 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire knowledge and skills for creating web Page	PSO-1	K1
CO-2	Understand the fundamental concepts of PHP programming	PSO-4	K2
CO-3	Apply the PHP syntax and semantics to develop simple web application	PSO-5	K3
CO-4	Develop web form and use GET, POST method in PHP.	PSO-2	K4
CO-5	Create dynamic web applications for the real-time need	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV			**PHP PROGRAMMING**						**Hours: 2**			
Code : 23CA4AP04												**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	4	3	4	2	5	5	4	3	4	3	3.64
CO-2	4	3	5	3	5	3	4	5	3	3	3	3.73
CO-3	5	4	3	4	3	4	3	3	4	3	5	3.73
CO-4	3	5	3	3	2	3	3	3	3	5	3	3.27
CO-5	4	3	4	5	3	3	4	3	5	3	4	3.73
Overall Mean Score												**3.62**

Result: The score for this course is **3.62** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF EXERCISES

1. Create a simple HTML form and accept the user-name and display the name through PHP echo statement.
2. Write a PHP program to get username as input and wish the user according to the current time.
3. Implement user-defined functions in PHP
4. Write a PHP program to authenticate the username and password.
5. Write PHP code to perform basic arithmetic operations (use buttons for addition, subtraction, multiplication, division).
6. Write a PHP program to get input from a html form for student information system and show that details using PHP.
7. Create a website for your department. Use relevant images, hyperlinks and form elements. Whenever an element is clicked, the corresponding details should be displayed using PHP.
8. Implement $_POST and $_GET methods
9. Validate the form fields for empty submission and correct email format. Display a confirmation message with the submitted data.
10. Perform read and write operations in a file using PHP
11. Create an application form and store the details in a database and display all application details.
12. Prepare Electricity Bill for N customers by retrieving the data from a database.

MULTIMEDIA LAB

Semester: IV **Hours: 3**

Code : 23SE4OA4A **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember the basics of multimedia, Images, Frame by Frame Animation, Tween, Mask, Text, Sound Effects.	PSO-1	K1
CO - 2	Understand the concepts of multimedia, Images, Frame by Frame Animation, Tween, Mask, Text, Sound Effects.	PSO - 4	K2
CO - 3	Apply the concepts of multimedia, Images, Frame by Frame Animation, Tween, Mask, Text, Sound Effects.	PSO - 5	K3
CO - 4	Analyze the concepts of multimedia, Images, Frame by Frame Animation, Tween, Mask, Text, Sound Effects.	PSO - 2	K4
CO - 5	Evaluate the concepts of multimedia, Images, Frame by Frame Animation, Tween, Mask, Text, Sound Effects.	PSO - 3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV			**MULTIMEDIA LAB**								**Hours: 3**
Code : 23SE4OA4A											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	4	3	3	3	5	5	3	3	4	3	3.55
CO-2	3	4	5	3	5	3	4	5	3	3	3	3.73
CO-3	5	3	3	4	3	4	3	3	4	3	5	3.64
CO-4	3	5	3	3	2	3	4	4	3	5	3	3.45
CO-5	3	3	3	5	3	3	3	3	5	3	4	3.45
Overall Mean Score												**3.56**

Result: The score for this course is **3.56** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF EXERCISES

1. Drawing images using tools
2. Frame-by-Frame Animation
3. Motion Tweening
4. Classic Tweening
5. Shape Tweening
6. Shape Tweening with shape hints
7. Multilayer Animation
8. Animation using Layer Mask
9. Animation using Guide Layer
10. Text Animation
11. Animation using buttons and sound effects
12. Short Story Creation

PHOTO EDITING LAB

Semester: IV **Hours: 2**

Code : 23CA4GE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Ascertain the knowledge and use of photo editing in digital era.	PSO-1	K1
CO-2	Understand features of a photo editing software.	PSO-2	K2
CO-3	Apply the photo editing skills to covert images into masterpiece	PSO-5	K3
CO-4	Analyze the working principles of various photo editing tools.	PSO-4	K4
CO-5	Evaluate the outcome of various effects and photo editing techniques.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV			**PHOTO EDITING LAB**						**Hours: 2**			
Code : 23CA4GE02												**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	3	4	3	3	5	5	4	3	3	4	3.64
CO-2	3	4	5	3	5	3	4	5	3	4	3	3.82
CO-3	5	3	3	4	2	4	3	4	4	3	5	3.64
CO-4	3	5	4	3	3	3	2	3	3	5	3	3.36
CO-5	3	4	3	5	2	3	3	3	5	3	3	3.36
Overall Mean Score												**3.56**

Result: The score for this course is **3.56** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF EXERCISES

1. Working with photoshop tools
2. Correcting backlight
3. Brightening Specific Spot
4. Mixed Black and White with Colors
5. Removing Facial Blemishes/ Mole
6. Clean Background and a Transparent image
7. Crop an Object and apply Zooming Effects
8. Blur Background
9. Watermark using Actions
10. Visiting Card Preparation with Text Effects
11. Create a banner
12. Replacing Color
13. Preparing Greeting Card
14. Photoshop HDR

GE-2: ORGANIZATION AND HEALTH PROGRAMME IN NCC

Semester: IV **Hours: 2**

Code : 23GE4NC02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the history, honors and awards of Indian Military.	PSO - 2	K1
CO - 2	Explain the map and weapon training to remove the fear of a weapon from the hearts of youth.	PSO - 1	K2
CO - 3	Illustrate the different types of disasters under different circumstances.	PSO - 4	K3
CO - 4	Analyze the practical knowledge in community development and other social programs.	PSO - 5	K4
CO - 5	Assess the personality development and develop technical skill of first Aid.	PSO - 3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV				**GE-2:ORGANIZATION AND HEALTH PROGRAMME IN NCC**							**Hours: 2**
Code : 23GE4NC02											**Credits: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	2	3	5	4	3	3	5	4	3	2	3.36
CO - 2	5	3	3	4	3	3	5	4	3	3	3	3.54
CO - 3	3	2	5	3	4	5	3	3	4	5	2	3.54
CO - 4	2	5	2	3	4	2	2	3	4	2	5	3.09
CO - 5	3	3	3	4	5	3	3	4	5	3	3	3.54
Overall Mean Score												**3.41**

Result: The Score for this Course is **3.41** (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

GE-2: ORGANIZATION AND HEALTH PROGRAMME IN NCC

2hrs/Week

UNIT I: Indian Military and NCC Organization **6 Hours**

History of Indian Military - Paramilitary forces -BSF- CRPF and CISF - NCC Organization and History- Aims and Objectives of NCC - Motto of NCC - DG's Four Cardinal Principles of NCC- NCC Song- Ranks in Army, Air force and Navy - Certificate Examination in NCC- Honors and Awards.

UNIT II: Map Reading **6 Hours**

Map and its features - kinds of north - Service protractor and Compass-bearing - Conversion of bearings - Conventional signs - Setting of map - Finding own position - Map to ground - Ground to map - Night March chart.

UNIT III: Hygiene and Sanitation **6 Hours**

Personal Hygiene - Sanitation - Methods of purification of drinking water -Latrine types - Urinal Types.

UNIT IV: Types Of Disease and Pollution **6 Hours**

Define Health - Types of Health - Communicable and Non communicable Disease - Pollution and its type.

UNIT V: First Aid **6 Hours**

Aims of First Aid - Principle of First Aid - Motto of First Aid - List of items in First aid Box - Types of Bandages - Types of Fracture -Dislocation - Types of Wounds - Burns and Scalds - Sprain - Strain - Asphyxia - Drowning - Poison - Shock - Snake bite - Sun and Heat Stroke - Insect bite - Dog bite - Hanging - Artificial Respiration - Haemorrhage.

BOOK FOR REFERENCE:

- Mishra R.C., A Handbook of NCC, Kanti Prakashan, Etawah, 2000.

ABILITY ENHANCEMENT COURSE-4 (AEC-4)

CAPACITY BUILDING

PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Gain theoretical knowledge and apply the expertise in different fields.
2.	Acquire Industry specific skills and can emerge as entrepreneurs.
3.	Develop critical and rational thinking to solve societal issues.
4.	Explore the knowledge and acclimatize it in the ever changing work environment.
5.	Evolve theories and develop innovative discipline specific ideas.
6.	Comprehend the nuances and develop innovative, discipline-specific ideas.

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Develop self-awareness, empathy and problem-solving.	PO-1
2.	Apply critical thinking, leadership and creativity.	PO-2
3.	Gain entrepreneurial, management and communication skills.	PO-3
4.	Practice digital responsibility, inclusiveness and technology use.	PO-4, PO-6
5.	Promote SDGs, community empowerment and sustainability.	PO-5

CAPACITY BUILDING

Semester: IV **Hours: 1**

Code : 23AE4CB04 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall key concepts of capacity building and its foundations.	PSO-1	K1
CO - 2	Explain essential skills such as communication, problem-solving and lifelong learning.	PSO-2	K2
CO - 3	Apply strategic planning, team building and organizational skills in practical contexts.	PSO-3	K3
CO - 4	Analyze community empowerment initiatives and technology-enabled practices.	PSO-4	K4
CO - 5	Evaluate innovative trends and sustainable development goals in capacity building.	PSO-5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: IV				CAPACITY BUILDING							Hours: 1
Code : 23AE4CB04											Credit: 1
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	4	3	2	4	2	5	4	3	2	4	3.45
CO - 2	4	5	4	2	3	2	4	5	4	2	3	3.45
CO - 3	3	4	5	4	2	4	3	4	5	4	2	3.64
CO - 4	3	4	4	5	3	5	3	4	4	5	3	3.90
CO - 5	2	4	4	3	5	3	2	4	4	3	5	3.55
Overall Mean Score												3.60

Result: The score for this course is **3.60** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction to Capacity Building **(3 Hours)**

UNIT II

Skills Development -essential skills-communication-problem solving-life long learning **(3 Hours)**

UNIT III

Organizational Strengthening-strategic planning-Team Building-Case Studies **(3 Hours)**

UNIT IV

Community Empowerment- Grassroots Initiatives **(3 Hours)**

UNIT V

Technology and Innovation-tech enabled learning-Innovation in capacity Building-Future Trends **(3 Hours)**

BOOKS FOR REFERENCE:

1. Senge, Peter M.*The Fifth Discipline: The Art and Practice of the Learning Organisation.* Doubleday, 1990.
2. Gilley, Jerry W., and Ann Maycunich Gilley.*The Manager as Change Agent: A Practical Guide to Developing High-Performanca People and Organisations.* Jossey-Bass, 1985.
3. Kanter, Rosabeth Moss. *Leadership for Change: Enduring Skills for Change Masters.* Harvard Business Review Press, 2015.

Continuous Internal Assessment Component (CIA)

Component	Marks
Role Play	25
Collage	25
Poster Making	25
Team Activities	20
Attendance	5
Total	**100**

OPERATING SYSTEM

Semester: V **Hours: 4**

Code : 23CA5MC06 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Recognize the fundamental concepts of Operating System	PSO-1	K1
CO-2	Understand mutual exclusion, deadlock algorithms and agreement protocols	PSO-4	K2
CO-3	Resolve user problems with standard operating environments	PSO-5	K3
CO-4	Analyze the scheduling algorithms and their complexity	PSO-2	K4
CO-5	Evaluate various device and resource management techniques	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V							**OPERATING SYSTEM**					**Hours: 4**
Code : 23CA5MC06												**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	3	3	3	5	5	3	3	4	3	3.45
CO - 2	3	4	5	3	5	3	4	5	4	3	3	3.82
CO - 3	5	4	3	4	2	4	3	3	4	3	5	3.64
CO - 4	4	5	3	3	2	3	4	3	3	5	3	3.45
CO - 5	3	3	3	5	3	3	3	3	5	3	4	3.45
Overall Mean Score												**3.56**

Result: The score for this course is **3.56** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction: operating system history (1990s to 2000 and beyond). **Process concepts:** definition of process - process states: Life cycle of a process - process management - process state and state transitions - process control block (PCB) - process operations - suspend and resume - context switching - Interrupts - Interrupt processing - interrupt classes, Interprocess communication -signals - message passing. **(12 Hours)**

UNIT II

Asynchronous concurrent processes: mutual exclusion- critical section - mutual exclusion primitives - implementing mutual exclusion primitives - Peterson's algorithm - n-thread mutual exclusion Lamport`s Bakery Algorithm - Semaphores -Mutual exclusion with Semaphores - thread synchronization with semaphores -counting semaphores - implementing semaphores. **Concurrent programming:** monitors. **(12 Hours)**

UNIT III

Dead lock and indefinite postponement: Resource concepts - four necessary conditions for deadlock - dead lock prevention - dead lock avoidance and Dijkstra's Banker's algorithm- dead lock detection - dead lock recovery.

(12 Hours)

UNIT IV

processor scheduling: scheduling levels -preemptive vs non-preemptive scheduling - priorities - scheduling objectives - scheduling criteria - scheduling algorithms-FIFO scheduling - RR scheduling- SRT scheduling- HRRN scheduling -multilevel feedback queues - Fair share scheduling.

(12 Hours)

UNIT V

Real Memory organization and Management: Memory organization - Memory management, Memory hierarchy - Memory management strategies - contiguous vs non-contiguous memory allocation - single user contiguous memory allocation -fixed partition multiprogramming - variable partition multiprogramming - Memory swapping. **Virtual Memory Organization:** virtual memory basic concepts - block mapping - paging - segmentation - segmentation/paging systems. **Virtual Memory Management:** Demand Paging - Page replacement strategies. **(15 Hours)**

COURSE BOOK:

- H.M. Deitel, **Operating Systems**, Third Edition, Pearson Education Asia, 2011.

UNIT I : Chapters: 1 (1.2-1.9), 3(3.3-3.6)

UNIT II: Chapters: 5 (5.2, 5.2.2, 5.2.3, 5.3, 5.4.2-5.4.3, 5.6), 6(6.2)

UNIT III: Chapters: 7 (7.4, 7.5, 7.7, 7.8, 7.10, 7.11)

UNIT IV: Chapters: 8 (8.2- 8.7)

UNIT V : Chapters: 9 (9.2-9.10), 10 (10.2-10.6), 11(11.3,11.6)

BOOKS FOR REFERENCE:

1. William Stallings, **Operating System: Internals and Design Principles**, Seventh Edition, Prentice - Hall of India, 2012.
2. A. Silberschatz, and P.B. Galvin, **Operating Systems Concepts**, Nineth Edition, John Wiley& Sons (ASIA) Pvt. Ltd., 2012.

WEBRESOURCES:

1. https://www.tutorialspoint.com/operating_system/index.htm
2. https://www.techtarget.com/whatis/definition/operating-system-OS
3. https://www.geeksforgeeks.org/operating-systems/
4. https://www.guru99.com/os-tutorial.html
5. https://www.studytonight.com/operating-system/

.NET PROGRAMMING

Semester: V **Hours: 4**

Code : 23CA5MC07 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Learn about basic features of ASP.NET and its controls	PSO-1	K1
CO-2	Illustrate the use of C# programming constructs and the .NET Framework	PSO-4	K2
CO-3	Solve real-world problems using ASP.NET and web controls.	PSO-5	K3
CO-4	Develop web application by connecting data sources using ADO.NET and managing them	PSO-2	K4
CO-5	Create web applications using XML	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V			**.NET PROGRAMMING**						**Hours: 4**			
Code : 23CA5MC07												**Credits: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	3	4	3	3	5	5	3	3	4	3	3.55
CO-2	4	4	5	3	5	3	4	5	4	3	3	3.91
CO-3	5	4	3	4	3	4	3	3	4	3	5	3.73
CO-4	4	5	3	4	3	3	4	3	3	5	3	3.64
CO-5	3	3	4	5	3	4	3	3	5	3	4	3.64
Overall Mean Score												**3.69**

Result: The score for this course is **3.69** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction to programming: First C# program - The C# Language and the .NET platform - visual studio IDE - Decompiling Code - Primitive types and Variables - Operators -Conditional statements - Loop - Arrays. **(12 Hours)**

UNIT II

ASP.NET Introduction: The .NET frame work - Learning the .NET Languages - Types, objects and namespaces. **Developing ASP .NET Applications:** ASP .NET applications - Web Forms fundamentals - Web controls - using visual studio .NET. **(12 Hours)**

UNIT III

Validation and Rich Controls - State management - Tracing logging and Error Handling**.** **(12 Hours)**

UNIT IV

Working with data: Overview of ADO .NET - ADO .NET data Access - data binding - the data list, data grid, and repeater - File, stream, and E-mail - using XML. **(12 Hours)**

UNIT V

Web Services: Web Services Architecture - creating webservices - using web services - **Advanced ASP .NET:** Custom controls - implementing a security - **ASP .NET Reference:** HTML server controls - web controls. **(12 Hours)**

COURSE BOOK:

1. Svetlin Nakov, Veselin Kolev & Co., **Fundamentals of Computer Programming with C#,** Faber publication, 2019.

   UNIT I : Chapters: 1, 2, 3, 5, 6, 7
2. Mathew, MacDonald, **The Complete Reference ASP .NET,** TataMcGraw-Hill, 2015.

   UNIT II : Chapters: 1,2,3,5,6,7,8
   UNIT III: Chapters: 9, 10, 11
   UNIT IV : Chapters: 12, 13, 14, 15, 16, 17
   UNIT V : Chapters: 18, 19, 20, 26, 27

BOOKS FOR REFERENCE:

1. Herbert Schildt, **The Complete Reference C# .NET**, Tata McGraw-Hill, 2017.
2. Anne Boehm, Joel Murach, **Murach's C# 2015,** Mike Murach & Associates Inc., 2016.
3. Denielle Otey, Michael Otey, **ADO.NET: The Complete reference**, McGraw Hill Publications, 2008.

WEB RESOURCES

1. https://www.geeksforgeeks.org/introduction-to-net-framework/
2. https://www.javatpoint.com/net-framework

OPTIMIZATION TECHNIQUES

Semester: V **Hours: 4**

Code : 23CA5MC08 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the basic knowledge of various optimization techniques and their applications.	PSO - 1	K1
CO - 2	Understand the usage of minimization and maximization techniques in real-world environment.	PSO - 2	K2
CO - 3	Solve simple problems of replacement and implement practical cases of decision making under different business environments.	PSO - 5	K3
CO - 4	Analyze the assignment and transportation problems critically and solve them by making proper decisions.	PSO - 4	K4
CO - 5	Assess the activities in a network problem and solve them by using PERT/CPM techniques.	PSO - 3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V				**OPTIMIZATION TECHNIQUES**							**Hours: 4**
Code : 23CA5MC08											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	3	3	4	3	3	5	5	4	4	3	4	3.73
CO - 2	3	4	5	3	5	3	4	5	3	4	3	3.82
CO - 3	5	3	3	4	2	4	3	4	3	3	5	3.55
CO - 4	3	5	4	3	4	3	2	3	3	5	3	3.45
CO - 5	3	4	3	5	2	3	3	3	5	3	3	3.36
Overall Mean Score												**3.58**

Result: The Score for this Course is: **3.58** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

GAMES AND STRATEGIES: Introduction - Two-Person Zero-Sum Games - Some Basic Terms - The Maximin-Minimax Principle - Games Without Saddle Points - Mixed Strategies - Graphic Solution of 2 x n and m x 2 Games - Dominance Property. **Linear Programming Problem Graphical Solution:** Introduction - Graphical Solution Method - Iso-profit approach. **(12 Hours)**

UNIT II

The Transportation Problem: Finding an Initial Basic Feasible Solution - NWC Rule - Matrix Minima Method - VAM - Test for Optimality - UV method - Degeneracy in Transportation Problem - Transportation Algorithm (MODI Method). Stepping Stone Solution Method - Some Exceptional Cases - Transportation Problem - Unbalanced Transportation Problem - Transshipment Problems - Time minimization. **(12 Hours)**

UNIT III

Assignment Problem: Introduction - Mathematical Formulation of the Problem - Solution methods of Assignment Problem - Special Cases in Assignment Problem - A typical Assignment Problem - The Travelling Salesman Problem. **(12 Hours)**

UNIT IV

Linear Programming Problem - Simplex Method: Introduction - Basic solution - Degenerate Solution - Basic Feasible Solution - Associated Cost Vector - Improved Basic Feasible Solution - Optimum Basic Feasible Solution - The Computational Procedure - The Simplex Algorithm - Use of Artificial Variables - Two - phase Method - Big-M Method. **Duality in Linear Programming:** Introduction - General Primal Dual Pair - Standard Primal Problem - Dual Problem - Formulating a Dual Problem - Dual Simplex Method. **(12 Hours)**

UNIT V

Network Scheduling By PERT/CPM: Introduction - Network Basic Components - Logical Sequencing - Rules of Network Construction - Critical Path Analysis - Probability Considerations in PERT - Distinction between PERT and CPM.

(12 Hours)

COURSE BOOK:

- Kanti Swarup, P.K. Gupta, Man Mohan, **"Operations Research",** Sultan Chand & Sons Publication, New Delhi, Reprint 2022.

UNIT I:	Chapter:	17.1 - 17.7, 3.1, 3.2
UNIT II:	Chapter:	10.9, 10.10, 10.12,10.13 - 10.17
UNIT III:	Chapter:	11.1 - 11.5, 11.7
UNIT IV:	Chapter:	4.1, 4.3, 4.4, 5.1, 5.2,5.3,5.9
UNIT V:	Chapter:	25.1 - 25.4, 25.6 - 25.8

BOOKS FOR REFERENCE:

1. R. Veerachamy, V. Ravi Kumar, **"Operations Research"**, I.K International Publishing House Pvt. Ltd, New Delhi, Reprint 2012.
2. A. M. Natarajan, P. Balasubramanie, A. Tamilarasi, **"Operations Research"**, Pearson Dorling Kindersley (India) Pvt. Ltd, Second Edition, 2017.

WEB RESOURCES:

1. https://www.geeksforgeeks.org/transportation-problem-set-6-modi-method-uv-method/
2. https://www.geeksforgeeks.org/transportation-problem-set-1-introduction/
3. https://www.topcoder.com/thrive/articles/Assignment%20Problem%20and%20Hungarian%20Algorithm
4. https://www.tutorialspoint.com/management_concepts/pert_estimation_technique.htm

.NET PROGRAMMING LAB

Semester: V **Hours: 4**

Code : 23CA5CP05 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Learn about basic features of ASP.NET and its controls	PSO-1	K1
CO-2	Illustrate the use of C# programming constructs and the .NET Framework	PSO-4	K2
CO-3	Solve real-world problems using ASP.NET and web controls.	PSO-5	K3
CO-4	Develop web application by connecting data sources using ADO.NET and managing them	PSO– 2	K4
CO-5	Create web applications using XML	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V			**.NET PROGRAMMING LAB**						**Hours: 4**			
Code : 23CA5CP05												**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	3	4	3	3	5	5	3	3	4	3	3.55
CO-2	4	4	5	3	5	3	4	5	4	3	3	3.91
CO-3	5	4	3	4	3	4	3	4	4	3	5	3.82
CO-4	4	5	3	4	4	3	4	3	3	5	3	3.73
CO-5	3	3	4	5	3	4	3	3	5	3	4	3.64
Overall Mean Score												**3.73**

Result: The score for this course is **3.73** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF EXERCISES

1. Simple .NET program
2. Implement the HTML Controls
3. Implement the Server Controls
4. Web application using Web controls.
5. Web application using List controls.
6. Web Page design using Rich control.
7. Validate user input using Validation controls.
8. Working with File concepts.
9. Web application using Data Controls.
10. Data binding with Web controls
11. Data binding with Data Controls.
12. Database application to perform insert, update and delete operations.
13. Database application using Data Controls to Perform insert, delete, edit, paging and sorting operation.
14. Implement the XML classes.
15. Implement Authentication and Authorization.
16. Ticket reservation using ASP.NET controls.
17. Online Quiz using ASP.NET controls.

MOBILE APPLICATION DEVELOPMENT LAB

(Theory: 2 Hours, Lab: 4 Hours- Practical alone for Examination)

Semester: V **Hours: 2+4**

Code : 23CA5CP06 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Install and configure Android application development tools.	PSO-1	K1
CO-2	Understand Java programming concepts to Android application development.	PSO-4	K2
CO-3	Deploy the application on Google Play Store	PSO-5	K3
CO-4	Analyse and Build enterprise level mobile applications with Kotlin on Android	PSO-2	K4
CO-5	Design and develop user Interfaces for the Android platform	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V			**MOBILE APPLICATION DEVELOPMENT LAB**						**Hours: 6**			
Code : 23CA5CP06												**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	3	4	3	3	5	5	3	3	3	3	3.45
CO-2	4	4	5	3	5	3	4	5	4	3	3	3.91
CO-3	5	4	3	4	4	4	3	4	4	3	5	3.91
CO-4	4	5	3	4	4	3	4	3	3	5	3	3.73
CO-5	4	3	4	5	3	4	3	4	5	3	4	3.82
Overall Mean Score												**3.76**

Result: The score for this course is **3.76** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Android Fundamentals: Android Versions -Features of Android - Architecture of Android - Anatomy of an Android Application-Simple Android Application. **Android User Interface:** Layouts: Linear, Relative, Frame and Scroll view-Managing changes to Screen Orientation. Views: Text View, Button, Image Button, Edit Text, Check Box, Radio Button, Radio Group, Progress Bar, Auto Complete Text View, List Views and Web View. **(18 Hours)**

UNIT II - V

1. Develop an application for Simple Counter
2. Develop an app to display your personal details using GUI Components.
3. Develop a Simple Calculator that uses radio buttons and text view.
4. Develop an app that uses Dialog Boxes.
5. Develop an app to display a Splash Screen.
6. Develop an app that uses different types of Menus.
7. Develop an app that plays Audio and Video.
8. Develop an app for Simple Animation.
9. Develop an app to send E-mail.
10. Create a login form and validate its content.
11. Create an app that utilizes SQLite database to store and retrieve data locally.
12. Develop an app that connects to a remote database server and implement create, read, update and delete operations.

COURSE BOOK:

- Wei Meng Lee**, Beginning Android Application Development,** Worx Publications (John Wiley), New York, 2012.

  UNIT I **:** Chapter: 1, 3, 4, 5

BOOKS FOR REFERENCE:

1. Ed Burnette, **Hello Android: Introducing Google's Mobile Development Platform,** 3rd edition, The Pragmatic Publishers, 2010.
2. Reto Meier, **Professional Android 4 Application Development,** Wrox Publications (John Wiley), New York, 2012.

WEB RESOURCES:

1. https://www.tutorialspoint.com/mobile_development_tutorials.htm
2. https://www.tutorials point.com›Android›Android-Home

SOFTWARE ENGINEERING

Semester: V **Hours: 4**

Code : 23CA5DE1A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Gain basic knowledge of Software Engineering concepts and applications	PSO-1	K1
CO-2	Understand the techniques and tools necessary for engineering practice	PSO-2	K2
CO-3	Apply current theories, models, and techniques that provide a basis for the software lifecycle	PSO-5	K3
CO-4	Analyze and Model reliable and cost-effective software system	PSO-4	K4
CO-5	Evaluate the Testing Tools and Techniques at various levels and produce efficient systems.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V				**SOFTWARE ENGINEERING**							**Hours: 4**
Code : 23CA5DE1A											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	4	3	3	5	5	4	4	3	4	3.82
CO-2	3	4	5	3	5	3	4	5	3	4	3	3.82
CO-3	5	3	3	4	2	4	3	4	3	3	5	3.55
CO-4	3	5	4	3	4	3	2	3	4	5	3	3.55
CO-5	3	4	3	5	3	3	3	3	5	3	3	3.45
												3.64

Result: The score for this course is **3.64** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction: The software engineering discipline - programs vs. Software products - emergence of software engineering - Notable changes in software development practices - computer systems engineering. **Software Life Cycle Models:** Classical water fall model - iterative water fall model - proto typing model evolutionary model - spiral model - comparison of different life cycle models. **(12 Hours)**

UNIT II

Requirements Analysis and Specification: Requirements gathering and analysis - Software requirements specification (SRS) **Software Design**: Good software design - cohesion and coupling - neat arrangement - approaches to software design. **(12 Hours)**

UNIT III

Function-Oriented Software Design: Overview of SA/SD methodology - structured analysis - data flow diagrams (DFD's) - Structured design, detailed design. **User-Interface design:** Characteristics of a good interface - basic concepts - types of user interfaces - component-based GUI development - a user interface methodology. **(12 Hours)**

UNIT IV

Coding and Testing: Coding - code review-testing- unit testing - black-box testing - white-box testing - debugging - program analysis tools - integration testing - system testing - some general issues associated with testing. **Software Reliability and Quality Management:** Software reliability; statistical testing; software quality; software quality management system - SEI capability maturity model. **(12 Hours)**

UNIT V

Computer Aided Software Engineering: CASE and its scope - CASE environment - CASE support in software life cycle - other characteristics of CASE tools - towards second generation CASE tool - architecture of a CASE environment. **Software Maintenance:** Characteristic of software maintenance - software reverse engineering -software maintenance process models - estimation of maintenance cost. **(12 Hours)**

COURSE BOOK:

- Rajib Mall, **Fundamentals of Software Engineering**, Prentice-Hall of India, Fifth Edition, 2018.

  UNIT I : Chapters: 1, 2

  UNIT II: Chapters: 4 (4.1-2), 5

  UNIT III: Chapters: 6, 9

  UNIT IV: Chapters: 10, 11

  UNIT V: Chapters: 12, 13

BOOKS FOR REFERENCE:

1. Richard Fairley, **Software Engineering Concepts**, Tata McGraw-Hill Publishing company Ltd, 1997.
2. Roger S. Pressman, **Software Engineering**, Seventh Edition, McGraw-Hill.
3. James A. Senn, **Analysis & Design of Information Systems**, Second Edition, McGraw-Hill International Editions.

WEB RESOURCES:

1. https://www.tutorialspoint.com/software_engineering/index.htm
2. https://www.geeksforgeeks.org/software-engineering/
3. https://www.javatpoint.com/software-engineering

SOFTWARE PROJECT MANAGEMENT

Semester: V **Hours: 4**

Code : 23CA5DE1B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Gain knowledge and to train software project managers.	PSO-1	K1
CO-2	Understand the principles and concepts of project management.	PSO-2	K2
CO-3	Apply software project management methodologies throughout the lifecycle	PSO-5	K3
CO-4	Analyze comprehensive project plans.	PSO-4	K4
CO-5	Evaluate and mitigate risks associated with software development process.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V			SOFTWARE PROJECT MANAGEMENT						Hours: 4			
Code : 23CA5DE1B									Credit: 3			
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO-1	4	3	3	3	3	5	5	4	4	3	4	3.73
CO-2	3	4	5	3	5	3	3	5	3	4	3	3.73
CO-3	5	3	3	4	2	4	3	4	3	3	5	3.55
CO-4	4	5	4	3	4	3	2	3	4	5	3	3.64
CO-5	3	4	3	5	3	3	3	2	5	3	3	3.36
Overall Mean Score												3.60

Result: The score for this course is **3.60** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Introduction: Introduction to Competencies - Product Development Techniques -Management Skills - Product Development Life Cycle -Software Development Process - The SEICMM - International Organization for Standardization. **(12 Hours)**

UNIT II

Managing Domain Processes: Project Selection Models - Project Portfolio Management- Understanding Financial Processes - **Selecting a Project Team** Goal **and Scope of the Software Project:** Project Planning - **Creating the Work Breakdown Structure** - Approaches to Building a WBS - Defining Project Milestones - Create Work Packages - Building a WBS for Software. **(12 Hours)**

UNIT III

Identifying the Tasks and Activities -Software Size and Reuse Estimating: The SEICMM and estimating - Problems and Risks with Estimating software size - Estimating Duration and Cost - Effort Measures - COCOMO: A Regression Model - COCOMO II - SLIM: A Mathematical Model. **(12 Hours)**

UNIT IV

Project Management Resource Activities During Execution-**Choosing Organizational Form**: Organizational Structure - Type of Software Development Dependencies - Brainstorming Dependencies and activities - Scheduling Fundamentals - PERT and CPM Scheduling - Leveling Resource Assignments - Map the Schedule to a Real Calendar - Critical Chain Scheduling. **(12 Hours)**

UNIT V

Software Quality Assurance- Software Configuration Management -Legal Issues in Software. **(12 Hours)**

COURSE BOOK:

- Robert T. Futrell, Donald F. Shafer, Linda I. Safer, "**Quality Software Project Management"**, Pearson Education Asia, 2002.

UNIT I : Chapters: 1, 3, 4

UNIT II: Chapters: 5, 6, 7, 8

UNIT III: Chapters: 9, 10

UNIT IV: Chapters: 12, 14, 15

UNIT V: Chapters: 30, 31, 32

BOOKS FOR REFERENCE:

1. Pankaj Jalote, **Software Project Management in Practice**, Addison Wesle, 2002.
2. Hughes, **Software Project Management**, Tata McGraw Hill,3rd Edition, 2004.

WEB RESOURCES:

1. https://www.geeksforgeeks.org/software-engineering-software-project-management-spm/
2. https://www.tutorialspoint.com/software_engineering/software_project_management.htm
3. https://www.smartsheet.com/content/software-project-management

AGILE PROJECT MANAGEMENT

Semester: V **Hours: 4**

Code : 23CA5DE1C **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the basic knowledge of agile project management.	PSO-1	K1
CO-2	Understand the software design, APIs and software technologies for Agile Management.	PSO-2	K2
CO-3	Apply the Agile Development and testing techniques.	PSO-5	K3
CO-4	Examine the strategies for planning and execution in Agile project management.	PSO-4	K4
CO-5	Evaluate the agile development and testing techniques.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V				**AGILE PROJECT MANAGEMENT**							**Hours: 4**
Code : 23CA5DE1C											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	3	3	3	5	5	4	3	3	4	3.64
CO-2	3	4	5	3	5	3	3	5	3	4	3	3.73
CO-3	5	3	3	4	2	4	3	3	3	3	5	3.45
CO-4	3	5	4	3	4	3	2	3	4	5	3	3.55
CO-5	3	4	3	5	3	3	3	2	5	3	3	3.36
Overall Mean Score												**3.55**

Result: The score for this course is **3.55** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Understanding Agile: Modernizing Agile: Project Management needed a Makeover - Introducing Agile project Management. **Applying the Agile Manifesto and principles:** Understanding the Agile Manifesto - Outlining the four values of the agile manifesto - Defining the 12 agile principles - Adding the platinum principles - Changes as a result of Agile values - The agile Litmus Test. **(12 Hours)**

UNIT II

Being Agile: Agile Approaches: Diving under the umbrella of agile approaches - Reviewing the Big Three: Lean, Scrum and Extreme programming. **Agile Environment in Action:** Creating the physical Environment - Low-Tech Communicating - High-Tech Communicating - Choosing Tools. **(12 Hours)**

UNIT III

Agile Behaviors in Action: Establishing agile Roles - Establishing new values - Changing Team Philosophy. **Defining the Product Vision and Product Roadmap:** Agile Planning - Defining the Product Vision - Creating a Product Roadmap - Completing the Product Backlog. **(12 Hours)**

UNIT IV

Planning Releases and Sprint: Refining requirements and estimates - Release Planning - Sprint Planning. **Showcasing Work, Inspecting and Adapting:** The Sprint Review - The sprint Retrospective. **Managing Scope and Procurement:** Managing Agile Scope - Managing Agile Procurement. **(12 Hours)**

UNIT V

Managing Time and Cost: Managing Agile Schedules - Managing Agile Budgets. **Managing Team Dynamics and Communication:** Managing agile Team Dynamics - Managing Agile Communication. **Managing Quality and Risk:** Managing Agile Quality - Managing Agile Risk. **(12 Hours)**

COURSE BOOK:

- Mark C. Layton and Steven J. Ostermiller, **"Agile Project Management for dummies",** Second Edition, John Wiley & Sons, Inc., 2017.

  UNIT I : Chapters: 1, 2

  UNIT II: Chapters: 4, 5

  UNIT III: Chapters: 6, 7

  UNIT IV: Chapters: 8, 10, 12

  UNIT V: Chapters: 13, 14, 15

BOOKS FOR REFERENCE:

1. Kevin Aguanno, **"Managing Agile Projects",** Multimedia Publications, First Edition, 2005.
2. James Turner, **"Agile Project Management- The ultimate guide to learn agile project management step by step",** Publishing Factory LLC, 2020.
3. John Carroll and David Morris, **"Agile Project Management in Easy Steps",** 2015.

WEB RESOURCES:

1. https://www.atlassian.com/agile/project-management
2. https://www.techtarget.com/searchcio/definition/Agile-project-management
3. https://www.cio.com/article/237027/agile-project-management-a-beginners-guide.html

INTRODUCTION TO DATA SCIENCE

Semester: V **Hours: 4**

Code : 23CA5DE2A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Understand the basics in Data Science and Bigdata	PSO-1	K1
CO-2	Overview and building process in Data Science.	PSO-2	K2
CO-3	Illustrate the Various Algorithms in Data Science.	PSO-5	K3
CO-4	Analyze Hadoop Frame work in Data Science.	PSO-4	K4
CO-5	Assess a real-time problem and perform Case study in Data Science.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES- PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V				**INTRODUCTION TO DATA SCIENCE**							**Hours: 4**
Code : 23CA5DE2A											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	3	4	3	5	5	4	3	3	4	3.73
CO-2	3	4	5	3	5	3	4	5	3	4	3	3.82
CO-3	5	3	3	4	2	4	3	3	3	3	5	3.45
CO-4	3	5	4	3	4	3	3	3	4	5	3	3.64
CO-5	3	4	3	5	3	3	3	2	5	3	3	3.36
Overall Mean Score												**3.60**

Result: The score for this course is **3.60** (**High** Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction: Benefits and uses of data science and bigdata-Facts of data-The Data science process- Big data eco system and data science. **(12 Hours)**

UNIT II

The Data science process: Overview of the data science process - research goals - retrieving data - transforming data -Exploratory Data Analysis -build the Models. **(12 Hours)**

UNIT III

Machine learning: The Modeling process - Types of machine learning: Supervised - Unsupervised - Semi - supervised. **(12 Hours)**

UNIT IV

Introduction to Hadoop: Hadoop frame work - Spark - replacing Map Reduce - NoSQL - ACID - CAP - BASE - NoSQL database types. **(12 Hours)**

UNIT V

Case Study: Prediction of Disease - Setting research goals - Data Retrieval - preparation-exploration -Disease profiling - presentation and automation.

(12 Hours)

COURSE BOOK:

- Davy Cielen, Arno D. B. Meysman, Mohamed Ali, **"Introducing Data Science",** Manning Publications, 2016.

  UNIT I : Chapters: 1 (1.1-1.4)
  UNIT II: Chapters: 2 (2.1-2.6)
  UNIT III: Chapters: 3
  UNIT IV: Chapters: 5 (5.1.1, 5.1.2), 6 (6.1-6.1.4)
  UNIT V: Chapters: 6 (6.2)

BOOKS FOR REFERENCE:

1. Davy Cielen, Arno, D.B. Meysman, Mohamed Ali, **Introducing Data Science: Big Data - Machine Learning - and More-Using Python Tools,** DreamTech Press, 2016.
2. Cathy O' Neil, Rachel Schutt, "**Doing Data Science Straight Talk from the Frontline"**, O'Reilly Media, 2013.
3. Lillian Pierson, **Data Science for Dummies**, Wiley Publication, II Edition, 2017.

WEB RESOURCES:

1. https://en.wikipedia.org/wiki/Data_science
2. https://www.heavy.ai/learn/data-science
3. https://www.simplilearn.com/tutorials/data-science-tutorial/introduction-to-data-science
4. https://www.w3schools.com/datascience/ds_introduction.asp

MACHINE LEARNING TECHNIQUES

Semester: V **Hours: 4**

Code : 23CA5DE2B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the knowledge and skills on the fundamental concepts and techniques of Machine Learning.	PSO-1	K1
CO-2	Understand the need of Machine Learning Skills and its applications	PSO-2	K2
CO-3	Use appropriate Supervised, unsupervised and regression techniques to solve real-time problems.	PSO-5	K3
CO-4	Analyze efficiency of Machine Learning algorithms	PSO-4	K4
CO-5	Create various data models using machine learning algorithms and evaluate their performance.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES- PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V			**MACHINE LEARNING TECHNIQUES**								**Hours: 4**
Code : 23CA5DE2B											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**				**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**
CO-1	4	3	3	4	2	5	5	4	4	3	3	3.64
CO-2	3	3	5	3	5	3	4	5	3	2	3	3.55
CO-3	5	3	3	4	2	3	3	3	4	2	5	3.36
CO-4	3	5	4	3	2	3	4	4	3	5	3	3.55
CO-5	3	3	3	5	2	3	3	3	5	3	3	3.27
Overall Mean Score											**3.47**

Result: The score for this course is **3.47** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Introduction to Machine Learning: Introduction - Types of Human Learning - What is Machine Learning? - Types of Machine Learning - Applications of Machine Learning. **Preparing to Model:** Machine Learning Activities - Basic Types of Data in Machine Learning - Exploring Structure of Data - Data Quality and Remediation - Data Preprocessing. **(12 Hours)**

UNIT II

Modelling and Evaluation: Selecting a Model - Training a Model - Model Representation and Interpretability - Evaluating Performance of a Model. **Basics of Feature Engineering:** Introduction - Feature Transformation - Feature Subset Selection. **(12 Hours)**

UNIT III

Bayesian Concept Learning: Bayes' Theorem - Bayes' Theorem and Concept Learning - Bayesian Belief Network. **Supervised Learning: Classification:** Example of Supervised Learning - Classification Model - Classification Learning Steps - Common classification Algorithms. **(12 Hours)**

UNIT IV

Supervised Learning: Regression: Example of Regression - Common Regression Algorithms. **Unsupervised Learning:** Unsupervised Vs Supervised Learning - Application of Supervised Learning - Clustering - Finding Pattern using Association Rule. **(12 Hours)**

UNIT V

Basics of Neural Network: Introduction - Understanding the Biological Neuron - Exploring the Artificial Neuron - Types of Activation Functions - Early Implementation of ANN - Architectures of Neural Networks - Learning Process in ANN - Backpropagation - Deep Learning. **(12 Hours)**

COURSE BOOK:

- Saikat Dutt, Subramanian Chandramouli and Amit Kumar Das, **Machine Learning,** Pearson Education, 2019

  UNIT I : Chapters: 1, 2

  UNIT II: Chapters: 3, 4

  UNIT III: Chapters: 6, 7

  UNIT IV: Chapters: 8, 9

  UNIT V: Chapter: 10

BOOKS FOR REFERENCE:

1. Shai Shalev-Shwartz and Shai Ben-David, **"Understanding Machine Learning: From Theory to Algorithms",** Cambridge University Press, 2014.
2. Tom M. Mitchell, **"Machine Learning",** McGraw Hill, Indian Edition, 2017.
3. Andreas C. Muller, Sarah Guido, **"Introduction to Machine Learning with Python",** O'Reilly, First Edition, 2017.

WEB RESOURCES:

1. https://www.ibm.com/topics/machine-learning
2. https://www.techtarget.com/searchenterpriseai/definition/machine-learning-ML
3. https://mitsloan.mit.edu/ideas-made-to-matter/machine-learning-explained
4. https://www.geeksforgeeks.org/machine-learning/

COMPUTATIONAL INTELLIGENCE

Semester: V **Hours: 4**

Code : 23CA5DE2C **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Describe the fundamentals of artificial intelligence concepts and searching techniques.	PSO-1	K1
CO-2	Understand the concepts of Neural Network and analyze and apply the learning techniques	PSO-2	K2
CO-3	Use the fuzzy logic sets and membership function and defuzzification techniques.	PSO-5	K3
CO-4	Analyze the artificial neural networks and its applications.	PSO-4	K4
CO-5	Evaluate the concept of Genetic Algorithm and Analyze the optimization problems using GAs.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES- PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V				**COMPUTATIONAL INTELLIGENCE**							**Hours: 4**
Code : 23CA5DE2C											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	4	4	2	5	5	4	3	3	3	3.64
CO-2	3	4	5	3	5	3	3	5	3	2	3	3.55
CO-3	5	3	3	4	2	3	4	3	4	2	5	3.45
CO-4	3	5	3	3	2	3	3	4	3	5	3	3.36
CO-5	3	3	3	5	2	3	3	3	5	3	3	3.27
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction: Neural Network - application scope of neural network - fuzzy logic - **Artificial neural network:** introduction - fundamental concept - evaluation of neural network - basic models of artificial neural network - important terminologies of ANNs. **(12 Hours)**

UNIT II

Introduction to fuzzy Logic, classical sets and fuzzy sets: introduction to fuzzy logic - **classical set:** operations on classical set - properties of classical set - function mapping of classical set - fuzzy set: fuzzy set operation - properties of fuzzy set. **(12 Hours)**

UNIT III

Back Propagation networks: Architecture of Backpropagation Networks, Back propagation Learning, Variation of Standard Back propagation Algorithm -Associative Memory - Adaptive Resonance theory. **(12 Hours)**

UNIT IV

Artificial Neural Networks: Fundamental Concepts- Basic Models of Artificial Neural Networks -Important Terminologies of ANNs-McCulloch - Pitts Neuron Linear Separability - Hebb Network. **(12 Hours)**

UNIT V

Genetic Algorithm: Introduction-Biological Background - Genetic Algorithm Vs Traditional Algorithm-Basic Terminologies in Genetic Algorithm-Simple GA-General Genetic Algorithm-Operators in Genetic Algorithm. (**12 Hours)**

COURSE BOOK:

1. S. N. Sivanandamand. S. N. Deepa, "**Principles of Soft Computing",** Wiley India Pvt. Ltd, 3rdEdition, reprint 2023

   UNIT I: Chapters: 1 (1.1-1.3), 2(2.1 -2.4)
   UNIT II: Chapter: 10
   UNIT IV: Chapters: 2 (2.1, 2.3, 2.4-2.7)
   UNIT V: Chapters: 21 (21.1, 21.2, 21.5-21.9)

2. S. Rajasekaran, G.A. Vijayalakshmi, "**Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis & Applications"**, 2011. 15th print.
   UNIT III: Chapters: 3 (3.1, 3.2, 3.7), 4, 5

BOOKS FOR REFERENCE:

1. F. Martin, MCneill, and Ellen Thro, "**Fuzzy Logic: A Practical approach",** AP Professional, 2000.
2. Chin Teng Lin, C.S. George Lee, "**Neuro-Fuzzy Systems**", Prentice Hall, 1996

WEB RESOURCES:

1. https://www.javatpoint.com/artificial-intelligence-tutorial
2. https://www.w3schools.com/ai/

INTERNSHIP

Semester: V

Code : 23CA5IN01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire the knowledge and skills to cope with the IT sector	PSO-1	K1
CO-2	Understand the recent trends and the demand in the technical field	PSO-2	K2
CO-3	Apply their programming skills in software development	PSO-5	K3
CO-4	Analyze the software tools and techniques for software project management	PSO-4	K4
CO-5	Develop and demonstrate quality software products	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V				**INTERNSHIP**							**Credits: 2**
Code : 23CA5IN01											
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	4	4	3	5	5	4	3	3	3	3.73
CO-2	3	4	5	3	5	3	3	5	3	3	3	3.64
CO-3	5	3	3	4	3	3	4	3	4	3	5	3.64
CO-4	3	5	3	3	4	3	3	4	3	5	3	3.55
CO-5	3	3	3	5	3	3	4	3	5	3	4	3.55
Overall Mean Score												**3.62**

Result: The score for this course is **3.62** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UG INTERNSHIP - GUIDELINES

I: Orientation and Company Overview

- Introduction to the organization, its vision, mission, and values.
- Understanding company structure, departments, and workflow.
- Familiarization with workplace culture, ethics, and professional behavior.
- Overview of tools, technologies, and platforms used in the company.

II: Learning Business Processes and Tools

- Study of day-to-day operations and standard practices.
- Exposure to software, hardware, or domain-specific tools used.
- Understanding documentation, reporting formats, and quality standards.
- Participation in small team activities or shadowing senior employees.

III: Technical and Skill Development

- Hands-on learning in relevant technical areas (programming, testing, networking, design, etc.).
- Applying theoretical knowledge to real-time tasks.
- Understanding problem-solving approaches in industry.
- Working with databases, applications, or industry-specific software.

IV: Mini/Live Project Participation

- Involvement in a small module or sub-task of a live project.
- Developing coding, debugging, or testing skills under supervision.
- Preparing reports, flowcharts, or system designs for assigned tasks.
- Collaboration with mentors, team leads, or project managers.

V: Project Completion and Report Preparation

- Completing a simple project or case study related to the internship.
- Preparing documentation of project activities, outcomes, and learnings.
- Presentation of project/report to department/company mentor.
- Reflection on overall internship experience and professional growth.

JACEP - EXTENSION

U.G. PROGRAMME OUTCOMES (2023 - 2026)

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Acquire comprehensive knowledge and evaluate analytically in their specific disciplines.
2.	Apply the acquired knowledge in professional and social life.
3.	Evolve new methodologies in the specific disciplines leading to innovation and employability.
4.	Develop critical thinking required to pursue research.
5.	Apply the computational and life skills to the challenging problems in life.
6.	Design and develop independent projects.

U.G. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO. NO.	UPON COMPLETION OF THIS PROGRAM THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO - 1	Understand and identify the needs of the community and articulate viewpoints both practically and theoretically.	PO-1
PSO - 2	Develop among themselves a sense of social and civic responsibility to be more culturally equipped.	PO-2
PSO - 3	Apply their education in finding practical solutions to individual, community problems to exercise their rights properly.	PO- 3
PSO - 4	Acquire leadership qualities and a democratic attitude by carrying out their duties as effective citizens of the country.	PO- 4
PSO - 5	Develop the capacity to think clearly and cogently to meet emergencies and national disasters and practise national integration and social harmony.	PO- 5, PO- 6

JACEP - EXTENSION

Semester: V-VI **Hours: 60**

Code : 23SLPEX01 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Impart knowledge on education.	PSO-1	K1
CO - 2	Analyse the reasons for health problems and impart knowledge on a balanced diet.	PSO-2	K2
CO - 3	Develop a concern for the voiceless and faceless and rectify it.	PSO-3, PSO-4	K3
CO - 4	Get awareness of environmental issues and solve the issues.	PSO-4	K4
CO - 5	Apply different fields of knowledge to the society.	PSO-5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: V -VI				**JACEP - EXTENSION**							**Hours: 60**
Code : 23SLPEX01											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	3	3	3	5	3	3	3	4	3.54
CO - 2	3	5	3	4	3	4	3	5	3	3	3	3.54
CO - 3	3	4	5	3	3	4	3	3	5	5	3	3.72
CO - 4	3	2	3	3	5	3	3	3	4	5	3	3.36
CO - 5	3	3	2	3	3	5	3	3	3	3	5	3.27
Overall Mean Score												**3.48**

Result: The Score for this Course is **3.48** (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I: LITERACY GROUP:

Giving orientation for the students about JACEP - importance of education awareness of dropouts and counselling the parents to re-admit the school dropouts- organizing activities based on the disciplines - arranging competitions for school children - educating the school children about the positives and negatives of social media- Higher studies after +2.

UNIT II: HEALTH AND HYGIENE GROUP:

Doing a survey on health problems - organizing medical camps and talks - organizing basic medical check-ups, conducting health and hygiene talk by B. Voc students of JAC to the adopted villages- Balance diet, orientation about home nurse-rapport with Government and NGO's

UNIT III: LIAISON GROUP & PEOPLE ORGANIZATION GROUP:

Motivating workers to access government savings schemes with unorganised sectors- celebrating important days - Services offered in E- Sevai centres-organizing income generation skill training for self-help groups. organizing population education programmes - conducting awareness programmes on emerging social issues - rapport with non-governmental organizations and local bodies to ensure the development of the villages - organizing youth, farmers and self-help group to function democratically-

UNIT IV: ENVIRONMENTAL GROUP:

Tree and sapling plantation - promotion of Herbal Gardens - observing environmental-related days -awareness campaign to educate the villagers to protect the environment.

UNIT V: APPLICATION OF KNOWLEDGE:

Conducting Special Skill Training for self-employment based on discipline to the target group with the help of NGO's and government organizations - awareness on social media.

BOOKS FOR REFERENCE:

1. Higher studies after +2
2. Services offered in E- Sevai services
3. பிறப்பு முதல் இறப்பு வரை அரசு ஆவணங்கள்/ சேவைகள் வழிகாட்டு கையேடு
4. அரசு நலத்திட்ட உதவிகள் தகவல் கையேடு
5. வருவாய் மற்றும் பேரிடர் மேலாண்மை துறை மூலம் பொது மக்களுக்கு

இ சேவை வழியாக இணையதள மின் சேவை

SCHEME OF EVALUATION

Continuous Internal Assessment		
1.	Attendance (60 hours)	10 Marks
2.	Field Visit & Report	50 marks
3.	Assignment	40 Marks
	Total	**100 marks**

COMPUTER NETWORKS

Semester: VI **Hours: 5**

Code : 23CA6MC09 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Gain the fundamental knowledge of network layered architecture	PSO-1	K1
CO-2	Understand the protocol stack of OSI reference model and TCP/IP Model	PSO-2	K2
CO-3	Apply the Error Correction, Error Detection and Flow Control	PSO-5	K3
CO-4	Compare and Analyze routing algorithm and connection-oriented and connectionless service	PSO-4	K4
CO-5	Evaluate the application layer services and security algorithms	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: VI			**COMPUTER NETWORKS**								**Hours: 5**
Code: 23CA6MC09											**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**				**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**
CO-1	4	3	3	3	2	5	5	4	3	3	3	3.45
CO-2	3	4	5	3	5	3	3	5	3	4	4	3.82
CO-3	5	3	4	3	2	3	4	3	4	3	5	3.55
CO-4	3	5	3	3	3	3	3	4	3	5	3	3.45
CO-5	3	3	3	5	2	3	4	3	5	3	4	3.45
Overall Mean Score												**3.54**

Result: The score for this course is **3.54** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction: Uses of Computer Networks- Network Hardware-Network Software-Reference Models- Example Networks. **(15 Hours)**

UNIT II

Physical Layer: Guided Transmission Media- Wireless Transmission - Communication Satellites -Digital Modulation and Multiplexing- Public Switched Telephone Network. **(15 Hours)**

UNIT III

Data Link Layer: Design Issues - Error Detection and Correction - Elementary Data Link Protocols - Sliding Window Protocols. **Medium Access Control Sublayer:** Channel Allocation Problem-Multiple Access Protocols-Bluetooth-RFID- Datalink Layer Switching. **(15 Hours)**

UNIT IV

Network Layer: Design Issues - Routing Algorithms - Congestion Control Algorithms -Quality of Service- The Network Layer in the Internet. **Transport Layer Services:** The Transport Service - Elements of Transport Protocol - Congestion Control- Internet Transport Protocols: UDP - Internet Transport Protocols: TCP.

(15 Hours)

UNIT V

Application Layer: The Domain Name System - Electronic Mail - The World Wide Web. **Network Security:** Cryptography - Symmetric key Algorithms - Public key Algorithms - Digital Signatures. **(15 Hours)**

COURSE BOOK:

- Andrew S. Tanenbaum, David J. Wetherall, **"Computer Networks"**, Prentice Hall, 5th Edition, 2011.

  UNIT I : Chapter: 1.1 - 1.4

  UNIT II: Chapter: 2.2 - 2.6

  UNIT III: Chapters: 3.1 - 3.4, 4.1, 4.2, 4.6, 4.7

  UNIT IV: Chapters: 5.1-5.4, 5.6, 6.1 - 6.5

  UNIT V: Chapters: 7.1-7.3, 8.1- 8.4

BOOKS FOR REFERENCE:

1. Behrouz A. Forouzan, **"Data Communications and Networking",** TATA McGraw Hill, Fifth Edition, Special Indian Edition, 2013.
2. F. Halsall, "**Data Communications, Computer Networks and Open Systems**", Pearson Education, 2008.
3. D. Bertsekas and R. Gallagher, **"Data Networks**", 2nd Edition, PHI, 2008.
4. Lamarca, **"Communication Networks"**, Tata McGraw-Hill, 2002.

WEB RESOURCES:

1. https://en.wikipedia.org/wiki/Computer_network
2. https://citationsy.com/styles/computer-networks

DATA ANALYTICS USING R PROGRAMMING

(Theory: 4, Lab: 2)

Semester: VI **Hours: 4+2**

Code : 23CA6MC10 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Remember the basic concepts of R programming and Data analytics	PSO-1	K1
CO-2	Understand the data types, functions, packages and interfaces in R Programming and elementary statistics	PSO-2	K2
CO-3	Apply the R programming skills to create charts and graphs and solve statistical functions	PSO-5	K3
CO-4	Analyze and interpret data using R programming	PSO-4	K4
CO-5	Evaluate different data models using R Programming	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: VI				**DATA ANALYTICS USING R PROGRAMMING**							**Hours: 6**
Code : 23CA6MC10											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	3	3	3	5	5	4	3	3	3	3.55
CO - 2	3	4	5	4	5	3	3	5	3	3	4	3.82
CO - 3	5	3	4	3	2	3	4	3	4	3	5	3.55
CO - 4	4	5	3	3	3	3	3	4	3	5	3	3.55
CO - 5	3	3	3	5	3	3	4	3	5	2	4	3.45
Overall Mean Score												**3.58**

Result: The score for this course is **3.58** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction: Features of R- Identifiers- Constants- Variables- Operators**. Data Types & Operations:** Basic Data Types- Vectors- List- Matrices- Arrays- Factors- Data Frames- Data Type Conversion. **(18 Hours)**

UNIT II

Flow Control: Decision Making - Loops- Loop Control Statements. **Functions and Packages:** Function Definition - Function Calling- Built-in Functions- Recursive Function- Infix Operator- Packages. **(18 Hours)**

UNIT III

Charts and Graphs: Bar Charts- Histograms- Line Graph- Pie Charts- Box Plots- Scatter Plots- Strip Charts- Density Plots- Dot Plots. **Connecting R to External Interfaces:** CSV Files- Microsoft Excel- Databases- XML Files- JSON Files- Binary Files. **(18 Hours)**

UNIT IV

Elementary Statistics: Probability Distribution- Z Tests- F Tests- Student's t- Test. **Basic Multivariate Analysis:** Correlation Analysis- Regression- Analysis of Covariance- Forecasting- Time series Analysis. **Advanced Multivariate Analysis:** Discriminant Analysis- Exploratory Factor Analysis- Cluster Analysis- Correspondence Analysis- Multidimensional Scaling- Conjoint Analysis- Decision Tree- Random Forest- Survival Analysis. **(18 Hours)**

UNIT V (Programming Demonstration in Lab)

1. Simple R Programs
2. Create a data set and do statistical analysis on the data
3. Implement Vectors, List, Data Frames
4. Read a csv file and analyze the data in the file in R.
5. Different types of Chart Creation
6. Statistical Summaries of the CSV Files
7. Implementing Regression Analysis
8. Implementing Decision Tree Algorithms
9. Implementing Random Forest Algorithm

COURSE BOOK:

- Jeeva Jose, **"Beginners Guide for Data Analysis using R Programming"**, Khanna Book Publishing, Co. (P) Ltd., First Edition, 2018.

  UNIT I : Chapters: 1, 2

  UNIT II: Chapters: 3, 4

  UNIT III: Chapters: 5, 6

  UNIT IV: Chapters: 7, 11, 12

BOOKS FOR REFERENCE:

1. Roger D. Peng, "**R Programming for Data Science**", Lulu.com, 2016
2. Norman Matloff, **"The Art of R Programming-A Tour of Statistical Software Design",** No Starch Press, 2011.

WEB RESOURCES:

1. https://www.listendata.com/p/r-programming-tutorials.html
2. https://data-flair.training/blogs/r-tutorials-home/
3. https://www.javatpoint.com/r-tutorial
4. https://www.datacamp.com/courses/free-introduction-to-r

IoT AND ITS APPLICATIONS

Semester: VI **Hours: 4**

Code : 23CA6MC11 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Illustrate the fundamental concepts of Internet of Things	PSO-1	K1
CO-2	Infer the smart objects and the technologies to connect them to network.	PSO-2	K2
CO-3	Apply the programming skills to produce smart devices	PSO-5	K3
CO-4	Analyze and interpret the impact and challenges posed by IoT networks leading to new architectural models.	PSO-4	K4
CO-5	Evaluate the different Application protocols for IoT	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: VI				**IoT AND ITS APPLICATIONS**							**Hours: 4**
Code : 23CA6MC11											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	4	3	3	2	5	5	4	3	3	3	3.55
CO-2	3	3	5	4	5	3	3	5	3	2	3	3.55
CO-3	5	4	3	4	2	3	3	3	3	2	5	3.36
CO-4	3	5	3	4	2	3	3	4	3	5	2	3.36
CO-5	3	3	3	5	2	4	3	3	5	3	4	3.45
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction & Concepts: Introduction to Internet of Things, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels. **(12 Hours)**

UNIT II

Domain Specific IoTs: Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Life Style. **(12 Hours)**

UNIT III

IoT& M2M: M2M, Difference between IoT and M2M, SDN and NFV for IoT, Software. **IoT System Management with NETCONF-YANG:** Need for IoT Systems Management, Simple Network Management Protocol, Network Operator Requirements, NETCONF, YANG, IoT Systems management with NETCONF-YANG. **(12 Hours)**

UNIT IV

IoT Physical Devices & Endpoints: What is an IoT Device, Exemplary Device, Board, Linux on Raspberry Pi, Raspberry Pi Interfaces- Other IoT Devices. **(12 Hours)**

UNIT V

Case Studies Illustrating IoT Design: Home Automation- Cities- Environment- Agriculture- Productivity Applications. **(12 Hours)**

COURSE BOOK:

- Vijay Madisetti and Arshdeep Bahga, **"Internet of Things: (A Hands-on Approach)",** Universities Press (INDIA) Private Limited, 1st Edition, 2015.

  UNIT I: Chapter: 1
  UNIT II: Chapter: 2
  UNIT III: Chapters: 3, 4
  UNIT IV: Chapters: 7
  UNIT V: Chapters: 12, 13

BOOKS FOR REFERENCE:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton, Jerome Henry, "**IoT Fundamentals Networking Technologies, Protocols and Use Cases for the Internet of Things"**, Pearson India Education Services Pvt. Ltd, 2019.
2. Michael Miller, "**The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World**", Kindle version.
3. Francisda Costa, **"Rethinking the Internet of Things: A Scalable Approach to Connecting Everything**", Apress Publications. 1st Edition, 2013.

WEB RESOURCES:

1. https://www.simplilearn.com/what-is-iot-how-and-why-it-matters-article
2. https://www.javatpoint.com/iot-internet-of-things
3. https://www.tutorialspoint.com/internet_of_things/index.htm

PROJECT

Semester: VI **Hours: 8**

Code : 23CA6PR01 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire practical knowledge and software engineering skills for project development.	PSO-1	K1
CO-2	Understand the need for the project and the hardware software requirements	PSO-2	K2
CO-3	Apply the programming and testing skills to design software product by considering the user requirements.	PSO-5	K3
CO-4	Analyze the current trends and forecast the future directions to enhance the software product	PSO-4	K4
CO-5	Develop an interactive and user-friendly project for real-world application	PSO-3	K56

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: VI							**PROJECT**					**Hours: 8**
Code : 23CA6PR01												**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	4	3	3	5	5	4	3	3	3	3.73
CO - 2	3	3	5	4	5	3	3	5	4	4	3	3.82
CO - 3	5	4	4	4	3	3	3	3	3	3	5	3.64
CO - 4	3	5	4	4	3	3	3	4	4	5	3	3.73
CO - 5	3	3	4	5	3	4	3	3	5	4	4	3.73
Overall Mean Score												**3.73**

Result: The score for this course is **3.73** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UG PROJECT - GUIDELINES

I: Requirement Analysis and Design

- Selection of project domain and problem identification.
- Gathering requirements (functional and non-functional).
- Preparing Software Requirement Specification (SRS).
- System design using Data Flow Diagrams, UML diagrams, ER diagrams, etc.
- Review I - Presentation of requirements and design for evaluation.

II: Database and Interface Design

- Designing database schema and relationships.
- Creating forms, input screens, and user interfaces.
- Wireframes/Prototype creation for front-end design.
- Mapping design with requirements to ensure feasibility.

III: Module Development and Coding

- Development of project modules based on design.
- Coding with proper documentation and coding standards.
- Unit testing of modules.
- **Review II** - Demonstration of developed modules and progress check.

IV: Integration and Testing

- Integration of all modules into a complete system.
- System testing (black-box, white-box, validation & verification).
- Debugging and performance optimization.
- Preparing user manual and technical documentation.

V: Project Implementation and Evaluation

- Final project implementation in lab environment.
- Preparation of final project report with all documentation.
- **Mock Viva** - Presentation and defense of project work before internal panel.
- Submission of final project for evaluation.

INFORMATION SECURITY

Semester: VI **Hours: 4**

Code : 23CA6DE3A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Remember the fundamentals concepts of Information and its security challenges	PSO-1	K1
CO-2	Understand the value of information to the modern organization	PSO-2	K2
CO-3	Examine and apply the fundamental techniques to safeguard the Information from security breaches	PSO-5	K3
CO-4	Analyze the security issues related to the CIA triad of Confidentiality, Integrity and Availability	PSO-4	K4
CO-5	Evaluate the security threats and potential security issues	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: VI				**INFORMATION SECURITY**							**Hours: 4**
Code : 23CA6DE3A											**Credit:3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	4	4	3	2	5	5	4	3	3	2	3.55
CO-2	3	3	5	4	5	3	3	5	4	3	3	3.73
CO-3	5	4	4	4	3	3	3	3	3	2	5	3.55
CO-4	3	5	4	4	2	3	3	4	4	5	2	3.55
CO-5	3	3	4	5	2	4	3	3	5	3	4	3.55
Overall Mean Score												**3.59**

Result: The score for this course is **3.59** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction: Computer Security- Threats- Harm- Vulnerabilities- Controls. **Toolbox: Authentication, Access Control, and Cryptography:** Authentication- Access Control. **(12 Hours)**

UNIT II

Programs and Programming: Unintentional (Non-malicious) Programming Oversights- Malicious Code- Malware- Countermeasures. **(12 Hours)**

UNIT III

The Web-User Side: Browser Attacks- Web Attacks Targeting Users- Obtaining User or Website Data- Email Attacks. **Operating Systems:** Security in Operating Systems- Security in the Design of Operating Systems- Rootkit. **(12 Hours)**

UNIT IV

Networks: Network Concepts. **War on Networks: Network Security Attacks:** Threats to Network Security Attacks- Wireless Network Security- Denial of Service- Distributed Denial of Service. **Strategic Defenses: Security Countermeasures:** Cryptography in Network Security- Firewalls- Intrusion Detection and Prevention Systems- Network Management. **(12 Hours)**

UNIT V

Details of Cryptography: Cryptology- Symmetric Encryption Algorithms- Asymmetric Encryption Algorithms- Message Digests- Quantum Cryptography. **(12 Hours)**

COURSE BOOK:

- Charles P. Pfleeger, Shari Lawrence Pfleeger, Jonathan Margulies, "**Security in Computing"**, Pearson Indian Education Services Pvt. Ltd., 5th Edition, 2018.
  UNIT I: Chapters: 1, 2
  UNIT II: Chapters: 3, 4
  UNIT III: Chapters: 5, 6
  UNIT IV: Chapters: 7, 8
  UNIT V: Chapters: 12, 13

BOOKS FOR REFERENCE:

1. William Stallings, **"Cryptography and Network Security",** Pearson Indian Education Services Pvt. Ltd., 7th Edition, 2017.
2. Behrouz Forouzan and Debdeep Mukhopadhyay, "**Cryptography and Network Security**", McGraw Hill Education, 3rd Edition, 2015.
3. Mark Stamp, **"Information Security: Principles and Practice",** Wiley, 2009.

WEB RESOURCES:

1. https://www.microsoft.com/en-in/security/business/security-101/what-is-information-security-infosec
2. https://www.geeksforgeeks.org/cryptography-introduction/
3. https://blog.rsisecurity.com/what-is-cryptography-in-cyber-security/

CLOUD COMPUTING

Semester: VI **Hours: 4**

Code : 23CA6DE3B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Gain the knowledge on fundamentals and essentials of Cloud Computing	PSO-1	K1
CO-2	Understand the need of Cloud Computing services and tools in their real-life scenarios	PSO-2	K2
CO-3	Apply the fundamental concepts in data centers to understand the tradeoffs in power, efficiency and cost	PSO-5	K3
CO-4	Analyze various cloud programming models and apply them to solve problems on the cloud	PSO-4	K4
CO-5	Evaluate cloud computing driven commercial systems and applications	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: VI				**CLOUD COMPUTING**							**Hours: 4**
Code : 23CA6DE3B											**Credit:3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	4	3	2	5	5	4	3	3	2	3.45
CO-2	3	3	5	4	5	3	3	5	4	3	3	3.73
CO-3	5	4	4	3	3	3	3	3	3	2	5	3.45
CO-4	3	5	3	4	2	3	3	3	4	5	2	3.36
CO-5	3	3	4	5	2	4	3	3	5	3	4	3.55
Overall Mean Score												**3.51**

Result: The score for this course is **3.51** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction to Cloud Computing: Introduction- Characteristics of Cloud Computing- Cloud Models- Cloud Services Examples- Cloud-based Services & Applications. **Cloud Concepts & Technologies:** Virtualization- Load Balancing- Scalability & Elasticity- Deployment- Replication- Monitoring- Software Defined Networking- Network Function Virtualization- MapReduce- Identity and Access Management- Service Level Agreement- Billing. **(12 Hours)**

UNIT II

Cloud Services & Platforms: Computer Services- Storage Services- Database Services- Application Services- Content Delivery Services- Analytics Services- Deployment & Management Services- Identity & Access Management Services- Open-Source Private Cloud Software. **(12 Hours)**

UNIT III

Cloud Application Design: Introduction- Design Considerations for Cloud Applications- Reference Architecture for Cloud Applications- Cloud Application Design Methodologies- Data Storage Approaches. **(12 Hours)**

UNIT IV

Cloud Application Benchmarking & Tuning: Introduction- Workload Characteristics- Application Performance Metrics- Design Considerations- for a Benchmarking Methodology- Benchmarking Tools- Deployment Prototyping- Load Testing & Bottleneck Detection Case Study- Hadoop Benchmarking Case Study. Cloud Security: Introduction- CSA Cloud Security Architecture- Authentication- Authorization- Identity & Access Management- Data Security- Key Management- Auditing. **(12 Hours)**

UNIT V

Case Study: Cloud for Industry, Healthcare & Education: Cloud Computing for Healthcare- Cloud Computing for Energy Systems- Cloud Computing for Transportation Systems- Cloud Computing for Manufacturing Industry- Cloud Computing for Education. **(12 Hours)**

COURSE BOOK:

- Arshdeep Bahga, Vijay Madisetti, **"Cloud Computing- A Hands-on Approach",** Universities Press, 2014
  UNIT I: Chapters: 1, 2
  UNIT II: Chapters: 3
  UNIT III: Chapter: 5
  UNIT IV: Chapters: 8, 12
  UNIT V: Chapter: 13

BOOKS FOR REFERENCE:

1. Douglas Corner, **"The Cloud Computing Book",** CRC Press, 2021
2. A. Srinivasan, J. Suresh, "**Cloud Computing: A practical approach for Learning and Implementation**", Pearson Education, Dorling Kindersley Pvt. Ltd., 2014
3. Pravin Mishra, **"Cloud Computing with AWS",** APress Publication, 2023

WEB RESOURCES:

1. https://azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-is-cloud-computing
2. https://www.ibm.com/topics/cloudcomputing#Cloud+computing+services
3. https://en.wikipedia.org/wiki/Cloud_computing
4. https://cloud.google.com/learn/what-is-cloud-computing

DIGITAL IMAGE PROCESSING

Semester: VI **Hours: 4**
Code : 23CA6DE3C **Credit: 3**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Illustrate the fundamental concepts of a digital image processing system	PSO-1	K1
CO-2	Interpret Image segmentation and representation techniques	PSO-2	K2
CO-3	Articulate various Image compression techniques	PSO-5	K3
CO-4	Analyze images in the frequency domain using various transforms	PSO-4	K4
CO-5	Evaluate the techniques for image enhancement and image restoration	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: VI							**DIGITAL IMAGE PROCESSING**					**Hours: 4**
Code : 23CA6DE3C												**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	3	4	3	2	5	5	4	3	3	2	3.45
CO-2	3	3	5	4	5	3	3	5	4	3	3	3.73
CO-3	5	3	4	3	3	3	3	3	3	2	5	3.36
CO-4	3	5	3	3	2	3	3	3	4	5	2	3.27
CO-5	3	3	4	5	2	4	3	3	5	3	4	3.55
Overall Mean Score												**3.47**

Result: The score for this course is **3.47** (High Relationship)
Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction: What is Digital Image Processing- The Origin of Digital Image Processing- Examples of Fields that use Digital Image Processing. Fundamental Steps in Digital Image Processing- Components of an Image Processing System. **Digital Image Fundamentals:** Elements of Visual Perception- Light and Electromagnetic Spectrum- Image Sensing and Acquisition- Image Sampling and Quantization-Some basic Relationships between pixels - An Introduction to the Mathematical Tools **(12 Hours)**

UNIT II

Intensity Transformations and Filtering: Background- Some Basic Intensity Transformation Functions- Histogram Processing- Fundamentals of Spatial Filtering- Smoothing Spatial Filters- Sharpening Spatial Filters- Combining Spatial Enhancements Methods- Using Fuzzy Techniques for Intensity Transformations and Spatial Filtering. **(12 Hours)**

UNIT III

Image Restoration and Denoising: Image Degradation- Types of Image Blur- Classification of Image restoration Techniques- Image restoration Model- Linear Image restoration Techniques- Non Linear Image restoration Techniques- Blind Deconvolution- Classification of Blind Deconvolution Techniques- Image Denoising- Classification of Noise in Image- Median Filtering- Trimmed Average Filter- Performance Metrics in Image Restoration- Applications of Digital Image Restoration. **(12 Hours)**

UNIT IV

Image Segmentation: Classification of Image Segmentation Techniques - Region Approach to Image Segmentation - Clustering Techniques- Image Segmentation based on Thresholding - Edge-based Segmentation- Classification of Edges - Edge Detection - Edge Linking - Hough Transform- Active Contour - Watershed Transformation - Shape Representation- Classification of Shape-representation Techniques. **Color-Image Processing:** Light and Color- Color Formation- Human Perception of Color - Color Model- The Chromaticity Diagram - Color Image Quantization - Histogram of a Color Image - Color Image Filtering - Gamma Correction of a Color Image- Pseudo Color - Color Image Segmentation.

(12 Hours)

UN'IT V

Image Compression: Need for Image Compression- Redundancy in Images- Classification of Redundancy in Images- Image compression Schemes- Fundamentals of Information Theory- Run length Coding- Shannon Fano Coding- Huffman Coding- Arithmetic Coding- Dictionary based Coding- Predictive Coding- Transform based Compression- Image compression standard- scalar Quantization- Vector Quantization- Types of Vector Quantization- Wavelet based Image Compression- Fractal Image Compression- Block Truncation Coding. **(12 Hours)**

COURSE BOOK:

1. Rafael C. Gonzalez and Richard E. Woods, **"Digital Image Processing",** Pearson Education, Third Edition, 2012.

   UNIT I: Chapters: 1, 2

   UNIT II: Chapter: 3

2. S. Jayaraman, S. Esakkirajan and T. Veerakumar, "**Digital Image Processing**", Tata McGraw Hill Education Pvt. Ltd, 2009.

   UNIT III: Chapter: 6

   UNIT IV: Chapters: 7, 11

   UNIT V: Chapter: 9

BOOKS FOR REFERENCE:

1. Vipin Tyagi, **"Understanding Digital Image Processing",** CRC Press, 2018.
2. Chris Solomon, Toby Breckon, "**Fundamentals of Digital Image Processing**", Wiley Blackwell, First Edition, 2011.
3. Rohit M. Thanki and Ashish M. Kothari, **"Digital Image Processing using SCILAB**", Springer, 2019.

WEB RESOURCES:

1. https://www.geeksforgeeks.org/digital-image-processing-basics/
2. https://www.javatpoint.com/digital-image-processing-tutorial
3. https://sisu.ut.ee/imageprocessing/book/1
4. https://www.v7labs.com/blog/image-processing-guide

OPEN-SOURCE TECHNOLOGIES

Semester: VI **Hours: 3**

Code : 23SE6CA04 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain knowledge of Open-Source ecosystem, its use, impact and importance.	PSO-1	K1
CO - 2	Understand the difference between open-source software and commercial software.	PSO-4	K2
CO - 3	Apply LAMP technologies for effective web developments.	PSO-5	K3
CO - 4	Analyze the need for web server for different application scenarios.	PSO-2	K4
CO - 5	Evaluate and develop applications using open-source technologies.	PSO-3	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Semester: VI				**OPEN-SOURCE TECHNOLOGIES**							**Hours: 3**
Code : 23SE6CA04											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	4	3	3	5	5	3	3	3	3	3.45
CO - 2	4	3	5	3	5	3	4	5	4	3	2	3.73
CO - 3	5	3	3	4	3	4	3	4	4	3	5	3.73
CO - 4	4	5	3	4	3	3	4	3	3	5	3	3.64
CO - 5	4	3	4	5	3	4	3	4	5	3	3	3.73
Overall Mean Score												**3.66**

Result: The score for this course is **3.66** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

The Web Explained: How it Works- What we Don't Talk About- Security. **Linux- The Choice of a GNU Generation:** Introduction- Basic Unix. **(9 Hours)**

UNIT II

Apache Web Server: Introduction- Starting, Stopping, and Restarting Apache- Configuration- Securing Apache- Create the Web Site- Apache Log Files. **Perl:** Perl Documentation- Perl Syntax Rules. **(9 Hours)**

UNIT III

MySQL: Tutorial- Database Independent Interface- Table Joins- Loading and Dumping a Database. **(9 Hours)**

UNIT IV

The Common Gateway Interface: Introduction- Apache Configuration- A First CGI Program- What can Go Wrong- CGI.pm Introduced- CGI.pm HTML Shortcuts- Information Received by the CGI Program- Form Widget Methods- CGI Security Considerations- A Note about die ( )- Project-CGI/MySQL/DBI. **(9 Hours)**

UNIT V

PHP: Introduction- Embedding PHP into HTML- Configuration- A Couple of Quick Examples- Language Syntax-Built-in PHP Functions- PHP and MySQl- Project.

(9 Hours)

COURSE BOOK:

- James Lee, Brent Ware, **"Open-Source Web Development with LAMP"**, Pearson Education, 2005.

UNIT I: Chapters: 1, 2
UNIT II: Chapters: 3, 4
UNIT III: Chapter: 5
UNIT IV: Chapter: 7
UNIT V: Chapter: 12

BOOKS FOR REFERENCE:

1. Eric Rosebrock, Eric Filson, **"Setting up LAMP: Getting Linux, Apache, MySQL and PHP and Working together**", John Wiley and Sons, 2004.
2. Jason Gerson, Elizabeth Naramore, Morgan L. Owens, Matt Warden, **"Professional LAMP: Linux, Apache, MySQL, and PHP5 Web Development",** 2006.
3. Colin McKinnon, **"LAMP- Performance end-to-end",** Colin McKinnon, 2015

WEB RESOURCES:

1. https://www.techtarget.com/whatis/definition/LAMP-Linux-Apache-MySQL-PHP
2. https://en.wikipedia.org/wiki/LAMP_(software_bundle)
3. https://www.ibm.com/topics/lamp-stack
4. https://www.redhat.com/sysadmin/lamp-server

MULTIMEDIA SYSTEMS

(Self-Study)

Semester: VI

Code : 23CA6SS01 **Credit: 2***

COURSE OUTCOMES:

- Acquire the knowledge and skills of the broad principles associated with multimedia concepts
- Understand the key components of multimedia technologies including text, graphics, voice, video and animation
- Apply the acquired knowledge in the field of multimedia and e-content development
- Analyze the impact of various tools and techniques to enhance the effectiveness of multimedia products
- Evaluate the different technologies that promote multimedia skills

UNIT I

What Is Multimedia: Definitions- Where to Use Multimedia- Delivering Multimedia. **Text:** The Power of Meaning- About Fonts and Faces- Using Text in Multimedia- Computers and Text- Font Editing and Design Tools- Hypermedia and Hypertext.

UNIT II

Images: Before You Start to Create- Making Still Images- Color- Image File Formats. Sound: The Power of Sound - Digital Audio- MIDI Audio - MIDI vs. Digital Audio- Multimedia System Sounds- Audio File Formats- Vaughan's Law of Multimedia Minimum- Adding Sound to Your Multimedia Project. **Animation:** The Power of Motion- Principles of Animation- Animation by Computer- Making Animations That Work.

UNIT III

Video: Using Video- How Video Works and Is Displayed- Digital Video Containers- Obtaining Video Clips- Shooting and Editing Video.

UNIT IV

Making Multimedia: The Stages of a Multimedia Project- What You Need: The Intangibles- What You Need: Hardware- What You Need: Software- What You Need: Authoring Systems. **Multimedia Skills:** The Team.

UNIT V

Planning and Costing: The Process of Making Multimedia- Scheduling- Estimating- RFPs and Bid Proposals.

COURSE BOOK:

- Tay Vaughan, "**Multimedia: Making It Work"**, McGraw Hill, 8th Edition, 2010.

  UNIT I: Chapters: 1, 2

  UNIT II: Chapters: 3, 4

  UNIT III: Chapters: 5, 6

  UNIT IV: Chapters: 7, 8

  UNIT V: Chapter: 9

BOOKS FOR REFERENCE:

1. Ralf Steinmetz, Karla Nahrstedt, **"Multimedia: Computing: Computing, Communications & Applications",** Pearson Education, 2012
2. Fred Halsall, "**Multimedia Communications**", Pearson Education, 2009

WEB RESOURCES:

1. https://www.tutorialspoint.com/multimedia/multimedia_systems.htm
2. https://www.encyclopedia.com/finance/finance-and-accounting-magazines/multimedia-systems
3. https://www.geeksforgeeks.org/multimedia-systems-with-features-or-characteristics/

HUMAN COMPUTER INTERACTION
(Self Study)

Semester: VI

Code : 23CA6SS02 **Credit: 2***

COURSE OUTCOMES:

- Outline and discuss usability goals and user experience goals for designing an interactive product
- Understand the concepts of usability, user experience and user-centered design
- Apply the acquired knowledge to produce simple prototypes of interactive products
- Analyze the technologies for interactive design
- Evaluate the prototyping and design patterns for interactive systems

UNIT I

The Human: Introduction- Input-output Channels- Human Memory- Thinking: Reasoning and problem solving- Emotion- Individual differences- Psychology and the design of interactive systems.

UNIT II

The computer: Introduction- Text entry devices- Positioning, pointing and drawing- Display devices- Devices for virtual devices 3D interaction- Physical controls, sensors and special devices- Paper: printing and scanning- Memory- Processing and networks.

UNIT III

The Interaction: Introduction- Models of Interaction- Frameworks and HCI- Ergonomics- Interaction Styles- Elements of WIMP interface- Interactivity- The context of the interaction- Experience, engagement and fun. **Paradigm:** Paradigms for interaction.

UNIT IV

Interaction design basics: What is design- The process of design- User focus- Scenarios- Navigation design- Screen design and layout- Iteration and prototyping. **HCI in the software process:** The software life- Usability Engineering- Iterative design and prototyping- Design rationale.

UNIT V

Universal Design: Universal Design Principles- Multi-modal interaction- Design for diversity. **User Support:** Requirement of user support-Approaches to user support- Adaptive help systems- Designing user support systems.

COURSE BOOK:

- Alan Dix, Janet Finaly, Gregory D. Abowd and Russell Beale, ''**Human-Computer Interaction"**, Pearson, Third Edition, 2023.

  UNIT I: Chapter: 1

  UNIT II: Chapter: 2

  UNIT III: Chapters: 3, 4

  UNIT IV: Chapters: 5, 6

  UNIT V: Chapters: 10, 11

BOOKS FOR REFERENCE:

1. K. Meena and R. Sivakumar, ''**Human-Computer Interaction**'', PHI Learning Pvt. Ltd.,2015
2. Martin G. Helander, Thomas K. Landauer and Prasad V. Prabhu, **"Handbook of Human-Computer Interaction**'', Elsevier Science B.V., 2nd Edition, 1997.

WEB RESOURCES:

1. https://www.interaction-design.org/literature/topics/human-computer-interaction
2. https://en.wikipedia.org/wiki/Human%E2%80%93computer_interaction
3. https://link.springer.com/referenceworkentry/10.1007/978-0-387-39940-9_192

ENTERPRISE RESOURCE PLANNING

(Self-Study)

Semester: VI

Code : 23CA6SS03 **Credit: 2***

COURSE OUTCOMES:

- Gain the fundamental knowledge of the ERP systems and their architecture
- Understand the use of Enterprise software and its role in integrating business functions
- Apply the ERP strategies to business processes
- Analyze the risks associated with the implementation of ERP in business modules.
- Evaluate the ERP marketplace and future trends and directions in ERP

UNIT I

Enterprise- An Overview: Business Functions and Business Processes-. Integrated Management Information- The Role of the Enterprise- Business Modeling- Integrated Data Model- Future of ERP- Career in ERP. **Business Processes:** Business Processes- Major Business Processes- New Business Models.

UNIT II

Introduction to ERP: Common ERP Myths- A Brief History of ERP- Reasons for the Growth of the ERP Market- The Advantages of ERP- Over Expectations in ERP- Roadmap for Successful ERP Implementation- The Role of CIO- The Future of ERP Packages. **Risks of ERP:** ERP Implementation Failures- Minimizing Risk- People, Process and Technology Risks of ERP- Implementation Issues- Operation and Maintenance Issues- The unique Risks of ERP Projects- Change Management- Managing Risk on ERP Projects.

UNIT III

Benefits of ERP: Information Integration- Reduction of Lead Time- On-Time Shipment- Reduction in Cycle Time - Improved Resource Utilization- Better Customer Satisfaction- Improved Supplier Performance- Increased Flexibility- Reduced Quality Costs- Better Analysis and Planning Capabilities- Improved Information Accuracy and Decision-making Capability- Use of Latest Technology.

UNIT IV

ERP and Related Technologies: Business Process Reengineering- Business Intelligence- Business Analytics- Reasons for Business Analytics- E-Commerce- M-Commerce- Data Warehousing- Data Mining- Anline Analytical Processing- Product Life Cycle Management- Supply Chain Management- Customer Relationship Management- Geographical Information Systems- Intranets and Extranets- Advanced Technology and ERP Security- Technological Advancements- Computer Crimes- ERP and Security- Computer Security- Crime and Security. **ERP Marketplace and Marketplace Dynamics:** Market Overview- ERP Market Tiers- On-Premise, SaaS and Cloud ERP- SaaS, IaaS and PaaS- Marketplace Dynamics- On-Premise ERP- Marketplace Dynamics- Cloud ERP- Industry-wise ERP Market Share- ERP-Indian Scenario- ERP Vendors- Oracle Corporation- Microsoft Dynamics- Infor- Epicor- Sage Group, PLC.

UNIT V

ERP, Internet and WWW-ERP-II: The Internet Explosion- ERP, Internet and WWW- ERP to ERP-II-Brining ERP to the Entire Enterprise- Best Practices. **Future Directions and Trends in ERP:** New Markets- New Channels- Faster Implementation Methodologies- Easier Customization Tools- Reduction in Implementation Time- Growth of Third Party Service Providers- Acquisitions and Mergers- Demand for International Solutions- Mobile ERP Solutions- Mobile ERP Solutions- Growth of BA and BI Solutions- Need-based Applications- On-Premise ERP Will Not Die- Expenditures- Open Source ERP- Enterprise Application Integration- ERP is Starting to Embed Social Collaboration- RFID Scanners- Market Snapshot- ERP Revenues.

COURSE BOOK:

- Alexis Leon, "**Enterprise Resource Planning**", McGraw Hill (India) Private Limited, Fourth Edition, 2019.
  UNIT I: Chapter: 1, 2
  UNIT II: Chapters: 3, 6
  UNIT III: Chapter: 7
  UNIT IV: Chapters: 8, 9
  UNIT V: Chapters: 23, 24

BOOKS FOR REFERENCE:

1. Carlo Caserio and Sara Trucco, "**Enterprise Resource Planning and Business Intelligence Systems for Information Quality**", Springer International Publishing AG, 2018.
2. Hany Elbardan, Ahmed Othman and Rashwan Kholief, "**Enterprise Resource Planning, Corporate Governance and Internal Auditing",** Palgrave Macmillan, 2017.

WEB RESOURCES:

1. https://www.tutorialspoint.com/management_concepts/enterprise_resource_planning.htm
2. https://www.coursera.org/articles/what-is-erp
3. https://www.geeksforgeeks.org/introduction-to-erp/

SKILL DEVELOPMENT PROGRAMME (SDP)

GRAPHICS DESIGNING

Theory 30 Hours, Practical 30 Hours: Total 60 Hours

Code	Title	Hours	Credit
24CA1SD01	Graphics Designing	2	1
24CA1SDP1	Graphics Designing - Lab	2	1
	Total (15 Weeks x 4 = 60 Hours)	**4**	**2**

GRAPHICS DESIGNING

Code: 24CA1SD01 **Hours: 2**
Credit: 1

UNIT I

Introduction: What is graphics? Types of Graphics, uses of graphics, software used for graphics designing. **Photoshop -Introduction:** Photoshop Interface, Raster graphics & vector graphics, Image formats, Operations on image. Manipulation of Image: The marquee tool, the lasso tool, magic Wand tool, Inverting Selection, Layers, Brush tool, Eraser tool, Fill tool, Blur tool, Smudge tool, Sharpen tool, Dodge tool, Sponge tool, Darken tool. **(6 Hours)**

UNIT II

Transformation & Retouching: Free transform, Scaling, rotation, Skew, perspective, Wrap, Distort, Crop, Image size, Canvas size, Clone stamp tool, Healing brush tool, patch tool, red eye tool, history brush tool. **Colour Correction**: Colour swatch, image modes, color adjustments, color selection. **Text:** The text tool, editing text, formatting, line & spacing, wrap text, text effects. **Effects:** Blending modes, styles, filters, liquefy, Vanishing point. Drawing: The pen tool, drawing shapes, managing paths, converting path to selection **(6 Hours)**

UNIT III

CorelDraw: Introduction: An overview, interface, menus and tools, working with new document, advanced options, page setup, dockers**. Drawing:** Lines, Shapes, objects, tables, templates **Import/Export:** Importing files, Using Corel Connect, Exporting files. **Manipulation:** Viewing options, pick tool, selection, moving, sizing, mirroring, rotating, skewing, undo, redo, staking order. **Text:** Artistic text, Paragraph text. **Duplication &Alignment:** understanding duplication, aligning objects, distribution, spacing. **Color:** coloring objects, uniform fill, fountain fill, understanding color palette, interactive fill, eyedropper tool, outline, convert to curve, outline properties, advanced outline options. Group, Combine, Weld, Trim, Intersect **(6 Hours)**

UNIT IV

Adobe InDesign: Looking at the Work Area: Using the tools, Using palettes, Workspaces, Using context menus, Opening and closing documents, Changing the view, Selecting objects, Saving a document, Recovering a document after a failure, Undoing mistakes, Working with preferences and defaults **Setting Up Pages:** Setting up basic layout options, Using rulers, grids, and guides, Working with pages and spreads, Numbering pages, Changing Numbering and Section Options, Using master pages, Laying out pages with frames, Adjusting layout objects automatically, Working with layers **(6 Hours)**

UNIT V

Setting Type: Formatting characters, Formatting paragraphs, Working with tabs, Copying type attributes with the eyedropper tool, Working with the type composition engines, Controlling hyphenation and justification, Paragraph and character style sheets, Creating nested styles, OpenType, Glyphs palette **Arranging and Combining Objects:** Modifying objects using graphics frames, Grouping and ungrouping objects, Stacking objects, Aligning and distributing objects, Locking object position, Moving objects, Changing size, proportions, or orientation, Duplicating objects **Applying Color:** About spot and process color types, working with swatches and unnamed colors, applying color, Using the Swatches palette, Mixed inks, Mixed ink groups, using swatch libraries, Using the Color palette, applying colors by dragging and dropping, creating gradients **Creating Tables:** Creating and editing tables, importing spreadsheets from Word or Excel, Advanced table techniques, Placing graphics into tables. **(6 Hours)**

COURSE BOOK:

Dr. A. Arul Anitha, Ms. A. Anusuya Banu, ''**Graphic Designing**''
(Course material will be prepared by the Department of BCA)

GRAPHICS DESIGNING - LAB

Code: 24CA1SDP1 **Hours: 2**

Credit: 1

LIST OF EXERCISES

PHOTOSHOP

1. Creating photoshop file
2. Correcting backlight
3. Lightening specific spot
4. Mixed black and white with colors
5. Enhancing portraits – removing red eye
6. Removing facial blemishes/mole
7. Removing white background on logo and turn into Transparent image
8. Cropping an object
9. Clean background
10. Bokeh effect / blur background
11. Zooming effect in picture
12. Watermark using actions
13. Panorama
14. Mass image editing using photoshop actions
15. Text effects
16. Create a banner
17. Photoshop HDR
18. Replacing color

CorelDraw

19. Working with artistic text
20. Working with Symbols and drawing shapes.
21. Working with Images and background colors adding special effects to Images
22. Text placing in line path
23. Design an Invitation using images, shapes and text.

InDesign

24. Working with Colors
25. Background and Border Designing
26. Working with Images
27. Importing content from MS Word and Excel
28. Creating a Brochure

SKILL DEVELOPMENT PROGRAMME (CERTIFICATE COURSE)

GANDHIAN THOUGHT

PAPER I: LIFE OF MAHATMA GANDHI

Code: CCHYGT01 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

- Gain Knowledge on the Early Life of Mahatma Gandhi.
- Analyse the racial equality and Mahatma Gandhi's Experience in South Africa.
- Explain the role of Mahatma Gandhi in Indian Freedom Struggle.
- Assess the constructive works of Mahatma Gandhi in Indian Nationalism.
- Discuss the major Incidents from the Life of Mahatma Gandhi.

UNIT I

Family background and beginnings of the Mahatma - Birth and childhood - Education and family life - lessons learned - The London Experience.

UNIT II

Making of the Mahatma: Gandhi in South Africa - From a barrister to a people's leader - Towards racial equality - From family life to ashram life - Birth of Satyagraha and constructive work - experiments with truth.

UNIT III

Beginnings of Indian Freedom Struggle: Early resistances and 1857 Revolt - Birth of Indian National Congress: Moderates, Extremists and Terrorists - Gandhi leads the nation in a new direction - Early micro satyagrahas.

UNIT IV

Mahatma Gandhi leads the Freedom struggle to victory: Major satyagrahas - Constructive Work - Sabarmathi and Sevagram - Various currents of Indian Nationalism - Towards partition and freedom - The final martyrdom.

UNIT V

Video shows on Gandhi - Field and life experiences - Incidents from the life of Gandhi that inspired and shaped your life.

தாள் I - மகாத்மா காந்தியின் வாழ்வு - CCHYGT01

Code: CCHYGT01 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

- Gain Knowledge on the Early Life of Mahatma Gandhi.
- Analyse the racial equality and Mahatma Gandhi's Experience in South Africa.
- Explain the role of Mahatma Gandhi in Indian Freedom Struggle.
- Assess the constructive works of Mahatma Gandhi in Indian Nationalism.
- Discuss the major Incidents from the Life of Mahatma Gandhi.

அலகு 1

குடும்ப பின்னணியும் மகாத்மாவின் தொடக்கமும் - பிறப்பும் குழந்தைப் பருவமும் - கல்வியும் குடும்ப வாழ்வும் - கற்ற பாடங்கள் - இலண்டன் அனுபவங்கள்.

அலகு 2

மகாத்மா உருவாகிறார் - தென்னாப்பிரிக்காவில் காந்தி - பாரிஸ்டரிலிருந்து மக்கள் தலைவராக - இன சமத்துவத்தை நோக்கி - குடும்ப வாழ்விலிருந்து ஆசிரம வாழ்வுக்கு - சத்தியாகிரகம் மற்றும் தீர்மானப்பணியின் தொடக்கம் - சத்திய பரிசோதனைகள்.

அலகு 3

இந்திய விடுதலைப் போராட்டத்தின் தொடக்கம் - ஆரம்ப கால எதிர்ப்புகளும் 1857 எழுச்சியும் - இந்திய தேசிய காங்கிரசின் தொடக்கம் - மிதவாதிகள், தீவிரவாதிகள் மற்றும் பயங்கரவாதிகள் - காந்தி நாட்டை புதிய திசையில் நடத்துகிறார் - ஆரம்ப வட்டார சத்தியாகிரங்கள்.

அலகு 4

மகாத்மா காந்தி இந்திய விடுதலைப் போராட்டத்தை தலைமையேற்று நடத்துகிறார் - தேசிய சத்தியாகிரங்கள் - நிர்மாணப் பணிகள் - சபர்மதியும் சேவாகிராமும் - இந்திய தேசியத்தின் பல்வேறு போக்குகள் - பிரிவினையும் விடுதலையும் - மகத்தான உயிர் தியாகம்.

அலகு 5

காந்தியைப் பற்றிய படங்கள் - கள மற்றும் வாழ்க்கை அனுபவங்கள் - உங்களது வாழ்வை பரவசப்படுத்திய, உருக்கிய மகாத்மா காந்தியின் வாழ்க்கை நிகழ்ச்சிகள்.

RECOMMENDED BOOKS

PAPER I

Mahatma Gandhi : An Autobiography சத்திய சோதனை

R. Nanda : Mahatma Gandhi - A Biography

Ravindra varma : Gandhi in Anecdotes, Navajivan Publishers, Ahmedabad, 2001

டி.டி. திருமலை : காந்தி

கல்கி : மாந்தருள் ஒரு தெய்வம் இவானதி பதிப்பகம் சென்னை 1991

திரு.வி.க. : காந்தியடிகளும் மனித வாழ்க்கையும்

ஜெயகாந்தன் : வாழ்விக்க வந்த காந்தி

J.B. Kriplani : Gandhi His Life and Thought

லூயி பிஷர் : மகாத்மா காந்தி

Louis Fischer : The Life of Mahatma Gandhi, Harper Collins Publishers, Uttarpradesh, 2017

பா. ஆனந்தி, மங்களவதி கேப்ரியல் ரூ : காந்திய சிந்தனை வினா-விடை

வி.ஏ. வித்யா : (Gandhian Thought Quiz)

சி. பெரிதாய் ரூ பா. ஆனந்தி : மகாத்மா காந்தியடிகளின் காலம்

COURSE BOOK:

- மகாத்மா காந்தியின் வாழ்வும் அறவியலும் - டாக்டர் பா. ஆனந்தி ரூ டாக்டர் ச. செயப்பிரகாசம்
- Life and Values of Mahatma Gandhi - Dr. B. Ananthi & Dr. S. Jeyapragasam

PAPER II: NON VIOLENCE AND SARVODAYA

Code: CCHYGT02 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

- Gain Knowledge on Mahatma Gandhi's Non - violence
- Discuss the Policies of Mahatma Gandhi on Truth and Action
- Analyse Sarvodaya and Antyodaya
- Assess the values introduced through Brahmacharya and Aparigraha
- Relate violence and Truth in our day today life with the teachings of Gandhiji

UNIT I

Meaning of Nonviolence (*ahimsa*): Nonkilling and noninjuring - Love, service and forgiving - Nonviolent Action: Peaceful resolution of conflict, nonviolent life style & constructive work and Satyagraha - Nonviolent values and ethics

UNIT II

Truth: Absolute and Relative - Moving beyond falsehood, errors and mistakes - Truth and pluralism - Truth and action - Truth and Nonviolence

UNIT III

Sarvodaya (welfare of all at all levels) and Antyodaya (welfare of the last first) - Means and Ends - Removal of untouchability - Communal Harmony - Uplift of Women

UNIT IV

Removal of poverty: Full & total appropriate employment - Self-dependence, Self - reliance, Swaraj and Swadeshi (love thy neighbour) - Self-control and Sublimation (*brahmacharya*) - Simple and Ethical living - *Aparigraha* (nonpossession) and Trusteeship (stewardship) - Appropriate and Holistic Science and Technology.

UNIT V

Place of Nonviolence and truth in our day to-day life and ways to enhance them - learn and practice three skills which would enhance your self-reliance and ability to help (serve) others in need - Resolve conflicts peacefully - Experience inter-religious relationships, dialogue and prayers.

தாள் II - அகிம்சையும் சர்வோதயமும்

Code: CCHYGT02 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

- Gain Knowledge on Mahatma Gandhi's Non - violence
- Discuss the Policies of Mahatma Gandhi on Truth and Action
- Analyse Sarvodaya and Antyodaya
- Assess the values introduced through Brahmacharya and Aparigraha
- Relate violence and Truth in our day today life with the teachings of Gandhiji

அலகு 1

அகிம்சையின் பொருள் - கொல்லாமையும் துன்பம் செய்யாமையும் - அன்பு, தொண்டு மற்றும் மன்னித்தல் - அகிம்சைச் செயல்- அமைதி வழியில் சிக்கல் தீர்வு, அகிம்சை வாழ்வியலும் நிர்மாணப்பணியும், சத்தியாகிரகம் - அகிம்சை அறவியலும் விழுமியங்களும்.

அலகு 2

உண்மை : பேருண்மையும் (முழுமை உண்மையும்) சார்பு உண்மையும்- பொய்மைகள், தவறுகள் மற்றும் குற்றங்களுக்கு அப்பால் செல்லுதல் - உண்மையும் பன்மியமம் - உண்மையும் செயலும் - உண்மையும் அகிம்சையும்.

அலகு 3

சர்வோதயமும் (அனைவரின் நலம் அனைத்து நிலைகளிலும்) அந்தியோதயமும் (கடையவர் நலன் முதலில்) - குறிக்கோளும் வழிமுறையும் - தீண்டாமை நீக்கம் - சமூக ஒற்றுமை - மகளிர் முன்னேற்றம்.

அலகு 4

வறுமை நீக்கம் : முழுமையான ஏற்புடைய வேலை வாய்ப்பு - தற்சார்பும் தன்னிறைவும், சுயராஜ்ஜியம் மற்றும் சுதேசி (அயலவரை நேசி) - புலனடக்கமும் மேன்மையாக்கமும் (பிரம்மச்சரியம்) - எளிய மற்றும் அறவியல் வாழ்வு உடைமையின்மையும், அறங்காவலர் நெறியும் - ஏற்புடைய மற்றும் முழுமை அறிவியலும் தொழில் நுட்பமும்.

அலகு 5

நமது அன்றாட வாழ்வில் அகிம்சையும் உண்மையும் பெறுமிடமும் அதனை மேம்படுத்தும் வழிகளும் - உங்களது தற்சார்பையும் தேவையில் பிறருக்கு உதவும் ஆற்றலையும் வளர்க்கும் ஏதாவது மூன்று திறன்களைக் (ளுமடைடள) கற்றல் - அமைதி வழியில் சிக்கல் தீர்வு அனுபவங்கள் - சர்வசமய நட்புறவு, உரையாடல் மற்றும் வழிபாட்டு அனுபவம் பெறல்.

RECOMMENDED BOOKS

PAPER II

M.K. Gandhi	: Sarvodaya
	: Nonviolence in Peace and War (2 Vols)
Richard B. Gregg	: Power of Nonviolence
மு. வசந்தா (பதி.)	: சர்வோதயம்
R.R. Diwakar	: The Saga of Satyagraha
ச. செயப்பிரகாசம்	: அகிம்சை, மதுரை, 2008

COURSE BOOK:

- மகாத்மா காந்தியின் வாழ்வும் அறவியலும் - டாக்டர் பா. ஆனந்தி ரூ டாக்டர் ச. செயப்பிரகாசம்
- Life and Values of Mahatma Gandhi - Dr. B. Ananthi & Dr. S. Jeyapragasam

SKILL DEVELOPMENT PROGRAMME (SDP)

LIBRARY AND INFORMATION SCIENCE

THEORY PAPER & PRACTICAL

PROGRAMME OUTCOMES (PO)

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Gain theoretical knowledge and apply the expertise in different fields.
2.	Acquire Industry specific skills and can emerge as entrepreneurs.
3.	Develop critical and rational thinking to solve societal issues.
4.	Explore the knowledge and acclimatize it in the ever changing work environment.
5.	Evolve theories and develop innovative discipline specific ideas.
6.	Comprehend the nuances and develop innovative, discipline-specific ideas.

THEORY PAPER & PRACTICAL
PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Have knowledge about the Library Resources and Services.	PO-2, PO-5
2.	To get Equipped with capabilities required for placement in Libraries	PO-2, PO-5
3.	To Use maximum of resources available in the Library.	PO-1
4.	Get the basic practical approaches to use online resources.	PO-5, PO-6
5.	Familiarize with the Principles of Management in Library Services.	PO-4

OBJECTIVES:

- To familiarize the students with the methods of maintaining Library Resources and Services.
- To equip them with capabilities required for placement in Libraries.

TEACHING HOURS

The Certificate course will be conducted in 60 contact hours per year as follows

Theory = 30 Hours
Practical = 30 Hours

ELIGIBILITY

Any III U.G. and any P.G. Student

SYLLABUS
THEORY PAPER

Code: 23GL1SD01 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Have knowledge about the various types of Libraries.	PSO - 1	K1
CO - 2	Understand the various kinds of Reference sources available in the Library	PSO - 1	K2
CO - 3	Get the analytical approaches to classify and Arrange the reading materials in Library	PSO - 2	K4
CO - 4	Apply various methods to search the reading material and thereby get it at the earliest	PSO - 3	K3
CO - 5	To Acquire knowledge about the managerial principles and techniques in Libraries.	PSO - 5	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Code: 23GL1SD01				**THEORY PAPER**							**Hours: 2** / **Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	4	4	4	4	4	3	4	4	4	4	3.82
CO - 2	4	4	4	4	4	4	4	4	4	4	4	4
CO - 3	3	3	4	4	4	3	3	4	4	3	3	3.45
CO - 4	4	4	4	4	4	4	4	4	4	4	4	4
CO - 5	4	4	4	3	3	3	3	3	4	4	4	3.55
Overall Mean Score												**3.76**

Result: The score for this course is **3.76** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

UNIT I: LIBRARY AND SOCIETY

Five Laws of Library Science - Extension services - Types of Library - Orientation to Library Staff and Students

UNIT II: INFORMATION SOURCES & SERVICES

Information - Reference Service, Definition, Kinds - Kinds of Sources of Information - Standard Ready Reference Sources - Bibliography - Definition, Types - Abstract: APA style.

UNIT III: CLASSIFICATION THEORY

Library classification - Definition, need and purposes - Colon Classification 6th Edition and Dewey Decimal Classification 20th Edition : General features.

UNIT IV: CATALOGUING THEORY

Definition, objectives and functions of catalogue - Physical and inner forms of catalogue - OPAC

UNIT V: LIBRARY MANAGEMENT

Principles of Management - Library Rules - Library routines (Selection, Acquisition, Technical processing) - Circulation Systems(Charging & Discharging), Automated charging system - Preservation of reading materials

UNIT VI: INFORMATION TECHNOLOGY

Computer application to Library work - Internet: General features, Search engines -e-resources - E-Library / Digital Library - INFLIBNET N-List, SHODHSINDH

PRACTICAL PAPER

Code: 23GL1SDP1 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Apply colon classification scheme in classifying the reading materials.	PSO - 2	K3
CO - 2	Analyse the title according to Dewey Decimal Classification Scheme.	PSO - 2	K4
CO - 3	Synthesis code for the book title according to colon Classification.	PSO - 5	K6
CO - 4	Apply code for the book title according to Dewey Decimal Classification.	PSO - 2	K3
CO - 5	Get practical approaches to search and download online resources.	PSO- 2	K3

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Code: 23GL1SDP1				**PRACTICAL PAPER**							**Hours: 2**
											Credit: 1
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**				**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**
CO - 1	3	3	4	4	4	4	3	4	4	4	3	3.64
CO - 2	4	3	4	4	4	4	4	4	3	4	4	3.82
CO - 3	4	4	4	4	4	3	3	4	4	3	3	3.64
CO - 4	3	4	4	4	4	4	4	4	4	4	4	3.91
CO - 5	3	4	4	3	3	3	3	3	4	4	4	3.45
Overall Mean Score												**3.69**

Result: The score for this course is **3.69** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Values Scaling:

Mean Score of Cos = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

Colon Classification -6th edition, Main Classes

1. Dewey Decimal Classification 20th edition - I, II & III Summary
2. Computer - Internet searching and to download information
3. INFLIBNET N-List - Searching process

BOOKS FOR REFERENCE:

1. Library Organisation and Decision Making - J. B.Sharma - Pointer Publishers, Jaipur - 2008
2. Library and Information Science - C.K. Sharma, Akhil Kumar Singh and Rakesh Kumar- Atlantic publishers & distributors (P) Ltd. - 2008
3. Reference Service - Mr. Krishan Kumar
4. Basics of Library and Information Science - K.T.Dilli, Vikas Publishing.
5. Preservation of Library, Archival and Digital Documents - L.S.Ramaiah & G. Sujatha - ESS ESS Publications, New Delhi - 2008
6. E-Libraries in Computer age - C.Praveen S ingh - Alfa publications, New Delhi - 2008
7. Colon Classification - S.R.Ranganathan - 6th Edition - Asia publishing house, New Delhi - 1960
8. Dewey Decimal Classification - Edited by John P Comaromi etc. - 20th Edition - Forest press, New York - 1989

EVALUATION METHOD

Theory Paper Code : 23GL1SD01		Practical Paper Code : 23GL1SDP1	
Internal	25 Marks	Internal	40 Marks
External	75 Marks	External	60 Marks
Total	**100 Marks**	**Total**	**100 Marks**

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - 2023-2026 -UG

CIA components for Practical can be decided by the respective Departments.

Passing Minimum in the Continuous Internal Assessment is Compulsory for appearing the External Semester Examination

Theory:

Component	Marks	Marks
Internal test I	40	Converted to 25
Internal test II	40	
Quiz	10	
Assignment	5	
Attendance	5	
Total	**100**	**25**

PRACTICAL:

Continuous Internal Assessment (CIA) - 40 Marks

External Practical Exam - 60 Marks

PASSING MINIMUM FOR EXTERNAL SEMESTER EXAMINATION -UG

Semester Examination		
Theory	40% out of 75 Marks (i.e. 30 Marks)	40% out of 100 Marks (i.e. 40 Marks)
Practical	40% out of 60 Marks (i.e. 24 Marks)	

INTERNAL QUESTION PATTEREN (UG)

Class: **Time: 2 Hours**

Date: **Max.: 40 Marks**

Title of the Paper

Course Outcome	Bloom's K-level	Q. No	SECTION
			SECTION – A (10 x 1 = 10 marks) MCQs
			SECTION – B (2 × 5= 10 Marks) Answer ALL Questions. (Internal Choice)
			SECTION – C (2x 10 =20 Marks) Answer All Question. (Internal Choice)

EXTERNAL QUESTION PATTEREN

UG External Question Pattern for the courses carrying credits 5 and above

Class: **Time: 3 Hours**

Date: **Max.: 100 Marks**

Title of the Paper

Course Outcome	Bloom's K-level	Q. No	SECTION
			SECTION – A (15 x 1 = 15 marks) MCQs
			SECTION – B (5× 2= 10 Marks) Answer any FIVE Questions out of SEVEN
			SECTION – C (5x 5 =25 Marks) Answer All Question. (Internal Choice, one question from each Unit)
			SECTION – D (5x 10 =50 Marks) Answer All Question. (Internal Choice, one question from each Unit)

EXTERNAL QUESTION PATTEREN

UG External Question Pattern for the courses carrying credits below 5

Class: **Time: 2 ½ Hours**

Date: **Max.: 75 Marks**

Title of the Paper

Course Outcome	Bloom's K-level	Q. No	SECTION
			SECTION – A (15 x 1 = 15 marks) MCQs
			SECTION – B (5x 6 = 30 Marks) Answer All Question. (Internal Choice, one question from each Unit)
			SECTION – C (3x 10 =30 Marks) Answer All Question. (Internal Choice)

SKILL DEVELOPMENT PROGRAMME (SDP)

LIBRARY AND INFORMATION SCIENCE

PROGRAMME OUTCOMES (PO)

PO NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Gain theoretical knowledge and apply the expertise in different fields.
2.	Acquire Industry specific skills and can emerge as entrepreneurs.
3.	Develop critical and rational thinking to solve societal issues.
4.	Explore the knowledge and acclimatize it in the ever-changing work environment.
5.	Evolve theories and develop innovative discipline specific ideas.
6.	Comprehend the nuances and develop innovative, discipline-specific ideas.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Have knowledge about the Library Resources and Services.	PO-2, PO-5
2.	To get Equipped with capabilities required for placement in Libraries	PO-2, PO-3
3.	To Use maximum of resources available in the Library.	PO-1
4.	Get the basic practical approaches to use online resources.	PO-5, PO-6
5.	Familiarize with the Principles of Management in Library Services.	PO-4

OBJECTIVES:

- To familiarize the students with the methods of maintaining Library Resources and Services.
- To equip them with capabilities required for placement in Libraries.

TEACHING HOURS

The Certificate course will be conducted in 180 contact hours per year as follows

Theory - Paper I = 60 Hours

Theory - Paper II = 60 Hours

Practical Paper = 60 Hours

ELIGIBILITY

Plus Two passed / Any U.G. and P.G. Student

SYLLABUS

THEORY PAPER - 1: FUNDAMENTALS OF LIBRARY AND INFORMATION SCIENCE

Code: 24GL1SD01 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

- Have knowledge about the types, principles, classification, cataloguing and routine work of the Library
- Understand the types, principles, classification, cataloguing and routine work of the Library
- Apply the principles, classification, cataloguing and routine work of the Library
- Get the analytical approaches in the types, principles, classification, cataloguing and routine work of the Library
- Evaluate the types, principles, classification, cataloguing and routine work of the Library

UNIT I

Library concept and definitions; Types of libraries - Public, Academic and Special Libraries - Role of libraries in modern society.

UNIT II

Five Laws of Library Science and their implications. Principles of Management - Library Budget, Types

UNIT III

Library classification - Definition, need and purposes - Colon Classification 6th Edition and Dewey Decimal Classification: Main Classes

UNIT IV

Library Cataloguing - Definition, objectives and functions of catalogue - Physical and inner forms of catalogue - OPAC

UNIT V

Various sections in a Library- Routine work in Acquisition, Technical, Circulation, Maintenance, Reference, and Binding Sections

BOOKS FOR REFERENCE:

1. Library Organisation and Decision Making - J. B.Sharma - Pointer Publishers, Jaipur - 2008
2. Library and Information Science - C.K. Sharma, Akhil Kumar Singh and Rakesh Kumar- Atlantic publishers & distributors (P) Ltd. - 2008
3. Basics of Library and Information Science - K.T.Dilli, Vikas Publishing.
4. Colon Classification - S.R.Ranganathan - 6th Edition - Asia publishing house, New Delhi - 1960
5. Dewey Decimal Classification - Edited by John P Comaromi etc. - 20th Edition - Forest press, New York - 1989
6. Current Trends and Fundamentals in Library and Information Science - Sr. R. Fatima Mary **Sylvia**,Pavai Publications, Chennai - 2012

THEORY PAPER -2: INFORMATION SOURCES & SERVICES

Code: 24GL1SD02 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

- Have knowledge about the types and kinds of Information Sources and Services.
- Understand the types and kinds of Information Sources and Services.
- Apply the types and kinds of Information Sources and Services.
- Get the analytical approaches of the types and kinds of Information Sources and Services in the practical life situation.
- Evaluate the types and kinds of Information Sources and Services.

UNIT I

Sources of Information - Documentary - Non- Documentary - Types of Information Sources - Primary, Secondary, Tertiary Sources

UNIT II

Kinds of Sources of Information - Standard Ready Reference Sources and Long-Range Reference Sources

UNIT III

Information Services - Reference Service - Definition, Need and Types - Ready Reference Service - Long Range Reference Service - User Needs - User Education, Extension services.

UNIT IV

E-resources - Concept and evolution; Merits and demerits of e-resources

UNIT V

Library Automation and Digitization- Digital Library- Artificial Intelligence applications in Libraries

BOOKS FOR REFERENCE:

1. Reference Service - Mr. Krishan Kumar
2. Digital Libraries Tools & Techniques - C. Praveen Singh - Alfa Publications, New Delhi - 2008
3. Library and Information Science - C.K.Sharma, Akhil Kumar Singh and Rakesh Kumar - Vol.III - Atlantic Publishers & Distributors (P) Ltd. - 2008
4. Current Trends and Fundamentals in Library and Information Science - Sr. R. Fatima Mary **Sylvia**, Pavai Publications, Chennai - 2012

PRACTICAL PAPER

Code: 24GL1SDP1 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

- Acquire the knowledge of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET
- Understand the concept of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET
- Apply the knowledge of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET
- Analyse the practical knowledge of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET
- Synthesis the practical approaches of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET

Paper 3 - INFORMATION PROCESSING PRACTICE

Code: 24GL1SDP1 **Hours: 2**

Credit: 1

4. Classification: Colon Classification 6th edition, Main Classes
5. Classification: Dewey Decimal Classification 20th edition - I, II & III Summary
6. ICT - Internet Browsing; Downloading
7. E-Resources in INFLIBNET N-List - Browsing; Downloading

BOOKS FOR REFERENCE:

1. Digital Libraries Tools & Techniques - C. Praveen Singh - Alfa Publications, New Delhi - 2008
2. Colon Classification - S.R.Ranganathan - 6th Edition - Asia publishing house, New Delhi - 1960
3. Dewey Decimal Classification - Edited by John P Comaromi etc. - 20th Edition - Forest press, New York - 1989

EVALUATION METHOD

Theory Paper – 1 Fundamentals of Library and Information Science Code : 24GL1SD01		**Theory Paper - 1 Information Sources & Services Code : 24GL1SD02**		**Practical Paper Code : 24GL1SDP1**	
Internal	25 Marks	Internal	25 Marks	Internal I	50 Marks
External	75 Marks	External	75 Marks	Internal II	50 Marks
Total	**100 Marks**	**Total**	**100 Marks**	**Purely Internal, Total**	**100 Marks**

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - 2023-2026 -UG
CIA components for Practical can be decided by the respective Departments.

Passing Minimum in the Continuous Internal Assessment is Compulsory for appearing the External Semester Examination

Theory: Internal Component

Component	**Marks**	**Marks**
Internal test I	40	Converted to 25
Internal test II	40	
Assignment I	10	
Quiz	10	
Total	**100**	**25**

Question Patern					
SECTION	**Types of Question**	**Number of Qns.**	**Number of Qns. to be answered**	**Marks for each Qn.**	**Total**
A Q. No (1-15)	Multiple Choice	15	15	1	15
B Q. No (16-21)	either or type.	6	5	5	30
C Q. No (22-24)	either or type	3	3	10	30

YOGA FOR YOUTH EMPOWERMENT

Semester: Non semester **Hours: 2**

Code : 23YYSD01 **Credit: 2**

OBJECTIVES:

- Providing value education to improve the students' character.
- Understanding yogic life and physical health.
- Maintaining youthfulness.
- Measure and method in five aspects of life.

UNIT: 1

Physical Health: Manavalakalai (SKY) Yoga - Introduction - Education as a means for youth empowerment - Greatness of Education - Yoga for youth Empowerment.

Simplified Physical Exercises - Hand, Leg, Breathing. Eye exercises - Kapalabathi, Makarasana Part I, Makarasana Part II, Body Massage, Acu pressure, Relaxation exercises – Benefits. **Yogasanas I** - Pranamasana - Hastha Uttanasana - Pada asthasana – Aswa Sanjalana Asana - Thuvipatha asva Sanjalana asana - Astanga Namaskara –Bhujangasana. Altha Muktha Savasana, Aswa Sanjalana Asana – Pada Hasthasana - Hastha Uttanasana - Pranamasana. **Pranayama** - Naddi suddi - Clearance Practice- Benefts. Simplified Physical Exercise - Kayakalpa Pracices - Meditation Practices. **(6 Hours)**

UNIT II

Life force: Reasons or Diseases - Natural reasons (Genetic / imprints, Planetary Position, Natural calamities and climatic changes) - Unnatural reasons (Food habits, Thoughts, Deeds). **Philosophy of Kaya kalpa** - Physical body - Sexual vital fluid - Life force - Bio-Magnetism-Mind. **Maintaining youthfulness** - Postponing old age - Transformation of food into seven components - Importance of sexual vital fluid - Measure and method in five aspects of life - Controlling undue Passion. **Kayakalpa practice** - Aswini Mudra - Ojas breath - Benefts of Kaya Kalpa. **(6 Hours)**

UNIT III

Mental Health: Mental Frequencies - Beta, Apha, Theta and Delta wave - Agna Meditation explanation-benefits. **Shanti meditation** - Shanthi Meditation explanation – benefits. **Thuriya Meditation** - Thuriya Meditation explanation – benefits. **Benefits of Blessing** - Self blessing (Auto suggestion) - Family blessing - Blessing the others -World blessing - Divine protection. **(6 Hours)**

UNIT IV

Values: Human Values - Self-control - Self-confidence - Honesty Contentment- Humility Modesty Tolerance- Adjustment- Sacrifice- Forgiveness. Purity (Body, Dress, Environment) - Physical purity - Mental purity - Spiritual purity. **Social Values -** Nonviolence - Service Patriotism Equality. Respect for parents and elders - care and protection - Respect for teacher. Punctuality - Time Management.

(6 Hours)

UNIT V

Morality (virtues): Importance of introspection - I - Mine (Ego, Possessiveness) Six Evil Temperaments - Greed - Anger- Miserliness - Immoral sexual passion Inferiority and superiority Complex - Vengeance. Maneuvering of Six Temperaments - Contentment Tolerance - Charity Chastity - Equality – Pardon (Forgiveness). Five essential Qualities acquired through Meditation - Perspicacity- Magnanimity - Receptivity - Adaptability -Creativity (Improved Memory Power).

(6 Hours)

BOOKS FOR REFERENCE:

- Yoga for modern age - Thathuvagnani Vethathiri Maharishi.
- Simplified Physical Exercises- Thathuvagnani Vethathiri Maharishi.
- Kayakalpam - Thathuvagnani Vethathiri Maharishi.
- Thirukkural - Rev.Dr.G.U.Pope.
- Mind- Thathuvagnani Vethathiri Mahaishi.
- Sound Health through yoga- Dr.Chandrasekaran.
- Light on yoga –BKS Jyenger.
- Unavu murai - Thathuvagnani Vethathiri Maharishi.

EVALUATION

YOGA FOR YOUTH EMPOWERMENT

Internal	External	Total
25	75	**100**

CIA Components

Component		Marks
Test-I	:	40
Test - II	:	40
Assignment	:	05
Quiz/Seminar	:	10
Attendance	:	05
Total	**:**	**100**

The total internal marks obtained for 100 will be Converted into marks obtained for 25

YOGA FOR YOUTH EMPOWERMENT

(EXTERNAL – EVALUATION)

Time: 3 Hours **Max. Marks: 75**

Part	Types of questions	Number of Qns.	Number of Qns. to be answered	Marks for each qn.	Total
A Q. NO (1-20)	MCQ(Four questions from each Unit)	20	20	1	20
B Q. NO (21-25)	Either (or) type. (Two questions from each unit)	10	5	5	25
C Q. NO (25-30)	Open choice (One question from each unit)	5	3	10	30

PRACTICAL - YOGA FOR YOUTH EMPOWERMENT -23YYSD02

Semester: Non- Semester **Hours: 2**

Code : 23YYSD02 **Credit: 1**

1. **Simplified Physical Exercises** - Hand, Leg, Breathing. Eye exercises - Kapalabathi, Makarasana Part I, Makarasana Part II, Body Massage, Acu pressure, Relaxation exercises – Benefits.
2. **Yogasanas I** - Pranamasana - Hastha Uttanasana - Pada asthasana – Aswa Sanjalana Asana - Thuvipatha asva Sanjalana asana - Astanga Namaskara – Bhujangasana. Altha Muktha Savasana, Aswa Sanjalana Asana – Pada Hasthasana - Hastha Uttanasana - Pranamasana.
3. **Pranayama** - Naddi suddi - Clearance Practice- Benefts. Simplified Physical Exercise - Kayakalpa Pracices - Meditation Practices.

YOGA FOR YOUTH EMPOWERMENT – PRACTICAL -I (Internal Only)

CIA Components for Internal Assessment

Components		**Marks**
Component - I (**Physical Exercises)**	:	50
Component - II (**Yogasanas I)**	:	25
Component - III (**Pranayama)**	:	25
Total	**:**	**100**