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.

B.Sc. COMPUTER SCIENCE

(2023-2026)

POST GRADUATE DEPARTMENT OF COMPUTER SCIENCE

B.Sc. COMPUTER SCIENCE SYLLABUS

With Effect from 2023-2024

As per the guidelines of the UGC, TANSCHE, MTU and to the current realities and emerging trends, the Integrated Curriculum of the B.Sc. Computer Science is restructured. It provides ample choice of courses of study to our 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.

At the end of the first year, the students should create a web page of their interest (minimum 20 Hours / at least 4 days) in summer vocation and can earn extra credits by submitting the reports. In II Year, summer vocation Internship i.e. at the end of second year, she has to go for the (30 Hours / at least 6 days).

EXTRA CREDIT COURSES

Professional Practice: Students can earn one more extra credit by submitting their certificate of attending International Conferences organized by other institutions in physical mode as a **Professional Practice.**

Self -Study Course: Students can opt for a MOOC / or a course in "Naan Muthalvan Scheme" in **Self -Study Course** and they have to submit the certificate to earn 2 credits extra.

Students can acquire more credits by undergoing certificate courses offered by other disciplines. For Self-Paced Learning, Professional Practice and Self Study course, the status of pass and extra credit will be indicated, but it will not be included for OPM.

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-Paced Learning Course	100	-	100

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - UG

Practical can be decided by the respective Department. 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**

Internal Components for Computer Fundamentals

Component	Mark
Internal test I	30
Internal test II	30
Lab Work	30
Record	5
Attendance	5
Total	**100**

INTERNSHIP CUM MINI PROJECT	
COMPONENT	**MARK**
Report Submission	25
Presentation and viva (internal)	25
External (Awarded by the Respective Guide / Intern site)	50
Total	**100**

PROJECT

INTERNAL		EXTERNAL	
COMPONENT	**MARK**	**COMPONENT**	**MARK**
First Review	10	Project Report	25
Second Review	10	External Viva Voce	25
Final Review (Internal Viva Voce)	30	**Total**	**50**
Total	**50**		

COMPONENTS FOR CIA

PAPER HAVING PRACTICAL ONLY (SEC - 2, SEC - 3 & General Electives)		SELF-PACED LEARNING	
COMPONENT	**MARK**	**COMPONENT**	**MARK**
Internal Test (2)	30+30	Project Execution & Output	30
Lab Work	30	Viva	30
Record	05	Presentation	20
Attendance	05	Report	20
Total	**100**	**Total**	**100**

INTERNAL COMPONENTS FOR PRACTICALS

COMPONENTS	BLOOM'S LEVEL	MARKS DISTRIBUTION
Lab Attendance	K1	5
Record	K2	5
Lab Work	K3	10
Internal Test (2)	K4	15
Viva	K5	5
Total		**40**

EXTERNAL COMPONENTS FOR PRACTICALS

COMPONENTS	BLOOM'S LEVEL	MARKS DISTRIBUTION
Problem Understanding	K1	5
Problem Description	K2	5
Problem Execution	K3	20
Problem Solution	K4	20
Viva	K5	10
Total		**60**

Components for fully Internal papers (Theory) (SEC 4 & General Electives)		
COMPONENT	**BLOOM'S LEVEL**	**MARK**
Internal Test (2)	K1-K5	40+40
Online Quiz	K3	10
Assignment	K2	05
Attendance	K1	05
Total		**100**

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)	

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		

INTERNAL QUESTION PATTERN - UG

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

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 5 Credits

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

U. G. PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Apply scientific knowledge to real life situations to become competent and committed.
2.	Acquire Industry specific skills and equip them to emerge as entrepreneurs.
3.	Explore the knowledge and acclimatize it in the ever-changing work environment.
4.	Design and conduct experiments/demos/create models to analyze and interpret data
5.	Communicate effectively on the findings of sciences and incorporate with existing knowledge
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 MAPPED
1.	Acquire fundamental knowledge in computing, problem solving and comprehensive knowledge in Computer Science.	PO - 6
2.	Inculcate critical thinking and skills to excel in technologies and its services used ethically in Public and Private Sectors, Teaching andResearch.	PO - 4,5
3.	Apply the acquired knowledge and competence to identify the real-world problems scientifically and develop a system to provide acomplete solution in a professional way.	PO - 1
4.	Demonstrate the ability to act as a leader or as a part of a team to create multi-functional Software Solutions with social and ethicalresponsibility.	PO - 2
5.	Adopt creative frameworks for sustainable development to becomea successful entrepreneur and capable of upgrading through innovation and current developments in technology.	PO - 3

U.G COURSE PATTERN - (2023-2026) UGC/TANSCHE/MTU)

Sem.	Part	Code	Title of the Paper	Hours	Credit
I	I	23GT1GS01/ 23GH1GS01	Tamil-I/ Hindi-I	6	3
	II	23GE1GS01	English-I	4	3
	III	23CS1MC01	Python Programming	4	4
		23CS1CP01	Python Programming - Lab	5	3
		23CS1MC02	Computer Fundamentals	2	2
		 23CS1AC1A/ 23CS1AC1B	**Elective Course-I:** Numerical Methods Discrete Mathematical Structures	5	3
	IV	23AE1PE01	**Ability Enhancement Course-1 (AEC-1):** Professional English	2	2
		23CS1FC01	**Foundation Course:** Problem Solving Techniques	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-II/ Hindi-II	6	3
	II	23GE2GS02	English-II	4	3
	III	23CS2MC03	Programming in C++	4	4
		23CS2MC04	Data Structures and Algorithms	3	3
		23CS2CP02	Data Structures using C++ - Lab	3	2
		23CS2CP03	Web Designing - Lab	2	1
		 23CS2AC2A/ 23CS2AC2B	**Elective Course-II:** Graph Theory and its Applications/ Optimization Techniques	4	4
	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 Paper	Hours	Credit
III	I	23GT3GS03/ 23GH3GS03	Tamil-III/ Hindi-III	6	3
	II	23GE3GS03	English-III	4	3
	III	23CS3MC05	Microprocessor and Microcontroller	5	4
		23CS3CP04	Microprocessor and Microcontroller-Lab	3	2
		23CS3AC3A/ 23CS3AC3B	**Elective Course-III:** PHP Programming/ Unix Programming	4	4
		23CS3AP3A	PHP Programming-Lab	3	2
	IV	23SE3CS03	**Skill Enhancement Course-2 (SEC-2):** Advanced Excel-Lab	1	1
		23CS3GE01/ 23GE3NC01	**Generic Elective 1:** Markup and Scripting Languages-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	-	-
		23CS3SS01	**Self-Paced Learning**: Web Page Creation	-	1**
			Total	**30**	**23+1****
IV	I	23GT4GS04/ 23GH4GS04	Tamil-IV Hindi-IV	6	3
	II	23GE4GS04	English-IV	4	3
	III	23CS4MC06	JAVA Programming	4	4
		23CS4MC07	Digital Computer Fundamentals	3	2
		23CS4AC4A/ 23CS4AC4B	**Elective Course-IV:** Cloud Computing/ Big Data Analytics	4	4
		23CS4CP05	JAVA Programming-Lab	3	2
	IV	23SE4OA4A	**Skill Enhancement Course-3 (SEC-3):** Multimedia-Lab	3	2
		23CS4GE02/ 23GE4NC02	**Generic Elective-2:** Animation using Flash-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 Paper	Hours	Credit
V	III	23CS5MC08	Computer Networks	4	4
		23CS5MC09	.NET Programming	4	4
		23CS5MC10	Advanced Database Management Systems	4	4
		23CS5CP06	.NET Programming-Lab	4	2
		23CS5CP07	Advanced DBMS-Lab	4	2
		23CS5DE1A/ 23CS5DE1B/ 23CS5DE1C	**Discipline Specific Elective-I:** Data Mining and Warehousing/ Information Security/ Agile Project Management	5	3
		23CS5DE2A/ 23CS5DE2B/ 23CS5DE2C	**Discipline Specific Elective-II:** Introduction to Data Science/ Robotics and Its Applications/ Human Computer Interaction	5	3
	IV	23CS5IN01	Internship Cum Mini Project	-	2
	V	23SLPEX01	**Service Learning Programme:** Extension-JACEP	-	-
		23CS5SS02	**Professional Practice:** Participation in International Conference	-	1**
			Total	**30**	**24+1****
VI	III	23CS6MC11	Software Engineering	5	5
		23CS6MC12	Computer Graphics	5	5
		23CS6MC13	Operating System	5	5
		23CS6PR01	Project with Viva-voce	8	4
		23CS6DE3A/ 23CS6DE3B/ 23CS6DE3C	**Discipline Specific Elective-III:** Image Processing Cyber Forensics Artificial Intelligence	4	2
	IV	23SE6CS04	**Skill Enhancement Course-4 (SEC-4):** Fundamentals of Statistics	3	2
	V	23SLPEX01	Service Learning Programme: Extension - JACEP	-	1
		23CS6SS01/ 23CS6SS02/ 23CS6SS03/ 23CS6SM01	Self-Study Course: Software Testing/ Web Application Development using LARAVEL/ Programming Smart Devices MOOC/ Naan Muthalvan Course	-	2*
			Total	**30**	**24+2***
			Total	**180**	**140+3*+2****

*** Common Extra Credit** **** Departmental Extra Credit & Fully Internal**

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 (மொழிபெயர்ப்புக் கதை) - செப்புமொழிபதினெட்டுடையாள் - 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=

PYTHON PROGRAMMING

Semester: I **Hours: 4**
Code : 23CS1MC01 **Credit: 4**
COURSE OUTCOMES

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Remember Digital computer, Problem Solving Strategies, Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO-1	K1
CO-2	Understand Digital computer, Problem Solving Strategies, Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO- 2	K2
CO-3	Apply Digital computer, Problem Solving Strategies, Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO-3	K3
CO-4	Analyze Digital computer, Problem Solving Strategies, Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO-5	K4
CO-5	Evaluate Digital computer, Problem Solving Strategies, Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO-4	K5

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

Semester: I				PYTHON PROGRAMMING							Hours: 4
Code : 23CS1MC01											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	2	2	5	5	2	4	3	3	3.27
CO-2	3	4	3	5	5	4	4	5	3	4	3	3.91
CO-3	5	4	4	3	3	2	2	3	5	4	4	3.55
CO-4	3	4	5	4	4	3	3	4	3	4	5	3.82
CO-5	4	5	3	2	2	3	3	2	4	5	3	3.27
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 to Digital computer: Introduction - Von Neumann Concept - Storage - Programming Languages -Translators - Hardware and Software - Operating Systems - **Problem Solving Strategies:** Problem Analysis - Algorithms - Flow Charts - Example of Algorithms and Flow Charts **(12 Hours)**

UNIT II

Introduction to Python: Introduction - Python Overview - Getting Started with Python - Comments - Python Identifiers - Reserved keywords - variables - Standard Data Types - Operators - Statement and Expression - String Operations - Boolean Expressions - Control Statements - Iteration - while Statement - Input from Keyboard. **(12 Hours)**

UNIT III

Functions: Introduction - Built - in Functions - Composition of Functions - User Defined Functions - Parameters and Arguments - Function Calls - The return Statement - Python Recursive Function - The Anonymous Functions -Writing Python Scripts. **(12 Hours)**

UNIT IV

Strings and Lists: Strings - Lists - **Tuples and Dictionaries:** Tuples - Dictionaries. **(12 Hours)**

UNIT V

Files and Expectations: Text Files - Directories - Exceptions - Exception with Arguments - User-Defined Exceptions. **(12 Hours)**

BOOK FOR STUDY

1. **"Introduction to Computing and Problem solving using Python",** E. Balagurusamy, McGraw Hill Education Private Ltd., I Edition, Reprint 2022

   UNIT I **:** Chapters: 1, 2

   UNIT II **:** Chapter: 3

   UNIT III **:** Chapter: 4

   UNIT IV **:** Chapters: 5, 6

   UNIT V **:** Chapter: 7

BOOKS FOR REFERENCE

1. **"Problem Solving and Python Programming",** S.A. Kulkarni, Yes Dee Publishing Pvt. Ltd., Second Edition, 2018.
2. **"Python Programming using Problem Solving Approach",** Reema Thareja, Published by Oxford Higher Education, 2017.

PYTHON PROGRAMMING - LAB

Semester: I **Hours: 5**

Code : 23CS1CP01 **Credit: 3**

COURSE OUTCOMES

CO. No.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Remember Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO-1	K1
CO-2	Understand Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO-2	K3
CO-3	Apply Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO- 3	K3
CO-4	Analyze Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO- 4	K4
CO-5	Evaluate Python Overview, Functions, Strings and Lists, Tuples and Dictionaries, Files and Expectations.	PSO- 5	K5

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

Semester: I				**PYTHON PROGRAMMING LAB**							**Hours: 5**
Code : 23CS1CP01											**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	2	3	4	4	5	5	4	3	2	3	3.45
CO-2	2	3	4	5	5	3	3	5	2	3	4	3.55
CO-3	5	3	2	3	3	4	4	3	5	3	2	3.36
CO-4	3	5	2	3	3	4	4	3	3	5	2	3.36
CO-5	4	2	5	3	3	3	3	3	4	2	5	3.36
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

1. Program to add two numbers, find the largest and smallest in the group.
2. Program for factorial of a number.
3. Program to calculate simple & Compound Interests
4. Program to find that given number is Armstrong, Adam and Perfect or not.
5. Program for User Defined functions
6. Program for Fibonacci series using recursion.
7. Program to convert decimal number into binary numbers.
8. Python Program to find sum of array and largest element in array.
9. Program to check if a string is palindrome or not.
10. Program to implement linear search and binary search.
11. Maintain book record as per their serial numbers in library using dictionary.
12. Program to string manipulation using dictionaries.
13. Perform following operations on dictionary 1) Insert 2) delete 3) change 4) update.
14. Program for file handling

COMPUTER FUNDAMENTALS

Semester: I **Hours: 2**

Code : 23CS1MC02 **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 computer concepts, Classifications of computers, Input / Output Devices, Word Processing, Internet and Internet applications, Word Processing and Presentations.	PSO -1	K1
CO - 2	Understand the computer concepts, Classifications of computers, Input / Output Devices, Word Processing, Internet and Internet applications, Word Processing and Presentations.	PSO - 2	K2
CO - 3	Apply the computer concepts, Classifications of computers, Input / Output Devices, Word Processing, Internet and Internet applications, Word Processing and Presentations.	PSO - 4	K3
CO - 4	Analyze the computer concepts, Classifications of computers, Input / Output Devices, Word Processing, Internet and Internet applications, Word Processing and Presentations.	PSO - 3	K4
CO - 5	Evaluate the computer concepts, Classifications of computers, Input / Output Devices, Word Processing, Internet and Internet applications, Word Processing and Presentations.	PSO - 5	K5

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

Semester: I				COMPUTER FUNDAMENTALS							Hours: 2
Code : 23CS1MC02											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	4	4	5	5	4	3	2	4	3.64
CO-2	4	3	2	5	5	4	4	5	4	3	2	3.73
CO-3	3	5	2	4	4	3	3	4	3	5	2	3.45
CO-4	5	4	3	3	3	4	4	3	5	4	3	3.73
CO-5	3	2	5	3	3	4	4	3	3	2	5	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 = 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 Computers: Evolution of Computers - Generation of Computers - Classification of Computers Analog Digital and Hybrid Computers. **Classification of Computers**: Super Computers - Mainframe Computers - Personal Computers (Different Types) and Terminals (Different Types). Characteristics of Computers - Block Diagram of a Digital Computer - types of OS. **(6 Hours)**

UNIT II

Input / Output Devices: Input Devices - Keyboard - Mouse - Output Devices - VDU - Printers. The User Interface - Using Mouse - Using right Button of the Mouse and Moving Icons on the screen - Use of Common Icons - Status Bar - Using Menu and Menu - selection - Running an Application - Viewing of File - Folders and Directories. Creating and Renaming of files and folders - Opening and closing of different Windows - Using help - Creating Short cuts - Basics of OS Setup - Common utilities. **(6 Hours)**

UNIT III

Understanding Word Processing: Word Processing Basics - Opening and Closing of documents - Text creation and Manipulation - Formatting of text - Table handling - Spell check - language setting and thesaurus - Printing of word document.

(6 Hours)

UNIT IV

Internet and Internet application: Introduction - Internet evolution Working of Internet - Use of Internet Overview of World Wide Web (Web Server and Client) - Introduction to Search engine and Searching the Web Downloading files Introduction to Web Browsers Working with E-mail (creation and use of the same).

(6 Hours)

UNIT V

Demonstration in Lab: Word Processing: Write files to optical discs - Create curriculum vitae (CV) of a B. Sc graduate with the specification - To prepare a class timetable using Merge rows, Split row, Insert rows, columns and convert the table into text format. **Making Small Presentation:** Basics of presentation software - Creating Presentation - Preparation and Presentation of Slides - Slide Show - Taking printouts of presentation / handouts. Practice And Understand Different Email Services - Outlook - Practice Creating E-Mail Accounts, Sending, Receiving & Storing of Mails. **(6 Hours)**

BOOK FOR STUDY

- ❖ Course Material prepared by parent Department.

BOOKS FOR RESERENCE

1. **"Fundamentals of Computers",** E. Balagurusamy, Tata McGraw Hill Pvt, Limited 2010.
2. **"Computer Fundamentals",** D. P Nagpal, S. Chand & Company Ltd, New Delhi, 2010
3. **"Fundamentals of Computers",** Rajaraman, 6th Edition, Prentice-Hall of India Private Limited, 2015.

Component	Mark
Internal test I	30
Internal test II	30
Lab Work	30
Record	05
Attendance	05
Total	**100**

NUMERICAL METHODS

Semester: I **Hours: 5**

Code : 23CS1AC1A **Credit: 3**

COURSE OUTCOMES

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Remember Algebraic and Transcendental Equations, Interpolation, Numerical Differentiation and Integration, Numerical Solution of Ordinary Differential Equations.	PSO-1	K1
CO-2	Understand Algebraic and Transcendental Equations, Interpolation, Numerical Differentiation and Integration, Numerical Solution of Ordinary Differential Equations.	PSO- 2	K2
CO-3	Apply Algebraic and Transcendental Equations, Interpolation, Numerical Differentiation and Integration, Numerical Solution of Ordinary Differential Equations.	PSO-3	K3
CO-4	Analyze Algebraic and Transcendental Equations, Interpolation, Numerical Differentiation and Integration, Numerical Solution of Ordinary Differential Equations.	PSO- 5	K4
CO-5	Evaluate Algebraic and Transcendental Equations, Interpolation, Numerical Differentiation and Integration, Numerical Solution of Ordinary Differential Equations.	PSO-4	K5

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

Semester: I				**NUMERICAL METHODS**								**Hours: 5**
Code : 23CS1AC1A												**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	2	3	4	4	5	5	4	3	2	3	3.45
CO - 2	3	3	2	5	5	4	4	5	3	3	2	3.55
CO - 3	5	2	3	4	4	3	3	4	5	2	3	3.45
CO - 4	3	4	5	3	3	2	2	3	3	4	5	3.36
CO - 5	3	5	4	2	2	3	3	2	3	5	4	3.27
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Algebraic and Transcendental Equations: Introduction - Errors in Numerical Computation - Iteration Method - Bisection Method - Regula Falsi Method - Newton-Raphson Method. **(15 Hours)**

UNIT II

Simultaneous Equations: Introduction - Simultaneous Equations - Back Substitution - Gauss Elimination Method - Calculation of Inverse of a Matrix - Crout's method. **(15 Hours)**

UNIT III

Interpolation: Introduction - Newton's Interpolation Formulae - Central Difference Interpolation Formulae - Lagrange's Interpolation Formulae - Divided Differences - Newton's Divided Differences Formulae - Inverse Interpolation. **(15 Hours)**

UNIT IV

Numerical Differentiation and Integration: Introduction - Derivatives using Newton's Forward Differences Formula - Derivatives using Newton's Backward Difference Formula - Derivatives using Central Difference Formulae - Maxima and Minima of the Interpolating Polynomial - Numerical Integration. **(15 Hours)**

UNIT V

Numerical Solution of Ordinary Differential Equations: Introduction - Taylor's Series Method - Picard's Method - Euler's Method - Runge-Kutta method.

(15 Hours)

BOOK FOR STUDY:

- **"Numerical Methods"** S. Arumugam, S. Thangapandi Issac, A. Somasundaram, Scitech Publications (India) Pvt. Ltd, Second Edition, Reprint 2017.

  UNIT I : Chapter : 3 (3.0 - 3.5)

  UNIT II : Chapter : 4 (4.0 - 4.3,4.5,4.6)

  UNIT III : Chapter : 7 (7.0 - 7.6)

  UNIT IV : Chapter : 8 (8.0 - 8.5)

  UNIT V : Chapter : 10(10.0 - 10.4)

BOOKS FOR REFERENCE:

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 Revised Edition, 2009.

DISCRETE MATHEMATICAL STRUCTURES

Semester: I **Hours: 5**

Code : 23CS1AC1B **Credit: 3**

COURSE OUTCOMES

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Remember Set theory, Function and Algorithms, Logic and Propositional Calculus, Vectors and Matrices, Recurrence relations.	PSO-1	K1
CO-2	Understand Set theory, Function and Algorithms, Logic and Propositional Calculus, Vectors and Matrices, Recurrence relations.	PSO-2	K2
CO-3	Apply Set theory, Function and Algorithms, Logic and Propositional Calculus, Vectors and Matrices, Recurrence relations.	PSO-4	K3
CO-4	Analyze Set theory, Function and Algorithms, Logic and Propositional Calculus, Vectors and Matrices, Recurrence relations.	PSO-3	K4
CO-5	Evaluate Set theory, Function and Algorithms, Logic and Propositional Calculus, Vectors and Matrices, Recurrence relations.	PSO-5	K5

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

Semester: I				**DISCRETE MATHEMATICAL STRUCTURES**							**Hours: 5**
Code : 23CS1AC1B											**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	2	4	4	5	5	4	3	3	2	3.45
CO - 2	4	2	2	5	5	3	3	5	4	2	2	3.36
CO - 3	4	5	3	3	3	2	2	3	4	5	3	3.36
CO - 4	5	4	3	3	3	4	4	3	5	4	3	3.73
CO - 5	2	3	5	4	4	3	3	4	2	3	5	3.45
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

Set theory: Introduction - Sets and Elements - Universal Set and Empty Set - Subsets - Venn Diagrams - Set Operations - Algebra of Sets and Duality - Finite, Infinite Sets and Counting Principle - The Inclusion Exclusion Principle - Classes of Sets, Power Sets, Partitions - Mathematical Induction - Multisets. **(15 Hours)**

UNIT II

Function and Algorithms: Introduction - Functions - One-to-one, onto, and Invertible Functions -Mathematical Functions, Exponential and Logarithmic Functions - Sequences, Indexed Classes of Sets - Recursively Defined Functions - Cardinality. **(15 Hours)**

UNIT III

Logic and Propositional Calculus: Introduction - Propositions and Compound Propositions - Basic Logical Operations - Propositions and Truth Tables - Tautologies and Contradictions - Logical Equivalence - Algebra of Propositions - Conditional and Biconditional Statements - Arguments - Logical Implications - Propositional Functions, Quantifiers - Negation of Quantified Statements.

(15 Hours)

UNIT IV

Vectors and Matrices: Introduction - Vectors - Matrices - Matrix Addition and Scalar Multiplication - Matrix Multiplication - Transpose - Square Matrices - Invertible (Nonsingular) Matrices, Inverses - Determinants - Elementary Row Operations, Gaussian Elimination (Optional) - Boolean (Zero-One) Matrices.

(15 Hours)

UNIT V

Recurrence relations: Introduction - Recursion - Recurrence Relation - Solving Recurrence Relations - Linear Homogeneous Recurrence Relations with Constant Coefficients - Solving Linear Homogeneous Recurrence Relations with Constant Coefficients. **(15 Hours)**

BOOK FOR STUDY:

1. **"Discrete Mathematics",** Seymour Lipschutz, Marc Lars Lipson and Varsha H. Patil, McGraw Hill Education, Revised 3rd Edition, Ninth Reprint 2017.

   Unit I: Chapter 1 - (1.1 - 1.12)

   Unit II: Chapter 3 (3.1 - 3.7)

   Unit III: Chapter 4 (4.1- 4.12)

   Unit IV: Chapter 5 (5.1 - 5.11)

   Unit V: Chapter 15 (15.1 - 15.6)

BOOKS FOR REFERENCE:

1. **"Discrete Mathematics and its Applications"**, Kenneth H. Rosen, McGraw - Hill International Editions, Fifth Edition, 2003.
2. **"Elements of Discrete Mathematics"**, C.L. Liu, Second Edition, McGraw - Hill, 1985.

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**

PROBLEM SOLVING TECHNIQUES

Semester: I **Hours: 2**
Code : 23CS1FC01 **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 Computer Problem-Solving, Fundamental Algorithms, Factoring Methods, Array Techniques, Text Processing and Pattern Searching, Recursive algorithms.	PSO-1	K1
CO-2	Understand Computer Problem-Solving, Fundamental Algorithms, Factoring Methods, Array Techniques, Text Processing and Pattern Searching, Recursive algorithms.	PSO- 2	K2
CO-3	Apply Computer Problem-Solving, Fundamental Algorithms, Factoring Methods, Array Techniques, Text Processing and Pattern Searching, Recursive algorithms.	PSO-4	K3
CO-4	Analyze Computer Problem-Solving, Fundamental Algorithms, Factoring Methods, Array Techniques, Text Processing and Pattern Searching, Recursive algorithms.	PSO-3	K4
CO-5	Evaluate Computer Problem-Solving, Fundamental Algorithms, Factoring Methods, Array Techniques, Text Processing and Pattern Searching, Recursive algorithms.	PSO-5	K5

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

Semester: I				**PROBLEM SOLVING TECHNIQUES**							**Hours: 2**
Code : 23CS1FC01											**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	2	4	4	5	5	4	3	2	2	3.27
CO - 2	3	2	2	5	5	4	4	5	3	2	2	3.36
CO - 3	4	5	2	3	3	4	4	3	4	5	2	3.55
CO - 4	5	4	3	4	4	3	3	4	5	4	3	3.82
CO - 5	2	3	5	4	4	3	3	4	2	3	5	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

Introduction to Computer Problem-Solving: Introduction - The Problem-solving Aspect-Top-down Design - Implementation of Algorithms - Program Verification - The Efficiency of Algorithms - The Analysis of Algorithms. **(6 Hours)**

UNIT II

Fundamental Algorithms: Exchanging the values of two variables - Counting - Summation of a set of numbers - Factorial computation - Sine function computation - Fibonacci Series generation - Reversing the digits of an integer - Base Conversion. **(6 Hours)**

UNIT III

Factoring Methods: Finding the square root of a number - The smallest divisor of an integer - Greatest common divisor of two integers - Generating prime numbers - Computing the prime factors of an integer - Generation of pseudo-random numbers - Raising a number to a large power - Computing the *n*th Fibonacci number. **(6 Hours)**

UNIT IV

Array Techniques: Array order reversal - Array counting or histogramming - Finding the maximum number in a set - Removal of duplicates from an ordered array - Partitioning an array - Finding the k^{th} smallest element - Longest monotone subsequence. **(6 Hours)**

UNIT V

Text Processing and Pattern Searching: Text line length adjustment - Left and right justification of text - Keyword searching in text - Text line editing - Linear pattern search. **Recursive algorithms**: Towers of Hanoi - Permutation generation. **(6 Hours)**

BOOK FOR STUDY:

1. R. G. Dromey, *How to Solve it by Computer*, Pearson India, 2007.

   UNIT I: Chapter: 1 **UNIT II:** Chapter: 2.1 - 2.8

   UNIT III: Chapter: 3 **UNIT IV:** Chapter: 4

   UNIT V: Chapters: 6.1 - 6.5, 8.3, 8.6

BOOKS FOR REFERENCE:

1. **"Digital Principles and Applications",** Donald P Leach, Albert Paul Malvino, Gautam Saha, McGraw Hill Education, Eighth Edition, Special Indian Edition, Sixth Reprint 2016.
2. **"PC Software for Windows 98 Made Simple"**, Ravi Taxali, McGraw Hill Education, 2017.

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 BOOK:

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

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 (உ.ஆ) - நாலாயிர திவ்யப் பிரபந்தம், 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

PROGRAMMING IN C++

Semester: II **Hours: 4**

Code : 23CS2MC03 **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 Principles of OOPs, Pointers, Virtual Functions and Polymorphism, Console I/O Operations, Files, Templates, Exception Handling.	PSO-1	K1
CO-2	Understand OOPs Concepts, Pointers, Virtual Functions and Polymorphism, Console I/O Operations, Files, Templates, Exception Handling.	PSO-2	K2
CO-3	Apply OOPs Concepts, Pointers, Virtual Functions and Polymorphism, Console I/O Operations, Files, Templates, Exception Handling.	PSO- 5	K3
CO-4	Analyze OOPs Concepts, Pointers, Virtual Functions and Polymorphism, Console I/O Operations, Files, Templates, Exception Handling.	PSO- 3	K4
CO-5	Evaluate OOPs Concepts, Pointers, Virtual Functions and Polymorphism, Console I/O Operations, Files, Templates, Exception Handling.	PSO- 4	K5

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

Semester: II				**PROGRAMMING IN C++**							**Hours: 4**
Code : 23CS2MC03											**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	2	3	3	5	5	3	4	3	2	3.36
CO - 2	4	2	3	5	5	3	3	5	4	2	3	3.55
CO - 3	3	3	5	4	4	3	3	4	3	3	5	3.64
CO - 4	5	4	3	3	3	2	2	3	5	4	3	3.36
CO - 5	4	5	4	3	3	4	4	3	4	5	4	3.91
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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / 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++:** What is 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, Expression 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 Variable - 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 Functions - Math Library Functions. **Classes and Objects:** Specifying a Class - Defining Member Functions - 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 Constructors - 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 Class - 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 - 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 I/O 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 (1.3-1.8), 2 (2.1-2.8), 3 (3.2 - 3.25)

  UNIT II : Chapters: 4 (4.1-4.12), 5 (5.3, 5.4, 5.6-5.19)

  UNIT III : Chapters: 6(6.1-6.11) ,7 (7.2-7.6, 7.8, 7.9),7 (7.2-7.6, 7.8, 7.9), 8 (8.3-8.12)

  UNIT IV : Chapters: 9 (9.1-9.4, 9.6-9.9), 10 (10.2-10.6), 11 (11.2-11.10)

  UNIT V : Chapters: 12 (12.1-12.8), 13, (13.2-13.9), 15 (15.2-15.7)

BOOKS FOR REFERENCE:

1. **"Object Oriented Programming with C++",** Reema Thareja, Oxford University Press, Revised First Edition, 2022.
2. **"The Complete Reference C++",** Herbert Schildt, Indian Edition, Fouth Edition, Reprint 2014.

DATA STRUCTURES AND ALGORITHMS

Semester: II **Hours: 3**

Code : 23CS2MC04 **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 basics of Algorithms & Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures.	PSO- 2	K1
CO-2	Understand Algorithms & Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures.	PSO- 3	K2
CO-3	Apply Algorithms & Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures.	PSO-1	K3
CO-4	Analyze Algorithms & Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures.	PSO- 4	K4
CO-5	Evaluate Algorithms & Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures.	PSO- 5	K5

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

Semester: II				**DATA STRUCTURES AND ALGORITHMS**							**Hours: 3**
Code : 23CS2MC04											**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	5	5	4	4	5	4	3	3	3.91
CO-2	5	3	3	4	4	3	3	4	5	3	3	3.64
CO-3	4	3	4	2	2	5	5	2	4	3	4	3.45
CO-4	4	5	3	4	4	2	2	4	4	5	3	3.64
CO-5	4	3	5	2	2	3	3	2	4	3	5	3.27
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 to Algorithms and Data Structures: Introduction - Algorithms - Data Structures. **Linear Data Structures:** Introduction - Arrays. **(9 Hours)**

UNIT II

Linear Data Structures: 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.

(9 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. **(9 Hours)**

UNIT IV

Advanced Data Structures: Introduction - Hash Tables - Heaps - AVL Trees - B Trees. **(9 Hours)**

UNIT V

Sorting: Introduction - Types of Sorting Algorithms - Sorting Techniques - Time Complexity of Sorting Techniques. **File Structures:** Introduction - Definitions and Concepts - Physical Structure of Hard Disk - File Operations - File Organization.

(9 Hours)

BOOK FOR STUDY:

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

  UNIT I : Chapters: 1 (1.1 - 1.3), 2 (2.1, 2.2)

  UNIT II : Chapter: 2 (2.3, (2.3.5-2.3.11), 2.4-2.6)

  UNIT III : Chapter: 3 (3.1,3.2 (3.2.1-3.2.7, 3.2.9-3.2.10), 3.3

  UNIT IV : Chapter: 4 (4.1 - 4.4, 4.6)

  UNIT V : Chapters: 5 (5.1 - 5.4), 6 (6.1 - 6.5)

BOOKS FOR REFERENCE:

1. **"Fundamentals of Data Structures in C++",** Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, University Press, Second Edition, Reprint 2013.
2. **"Data Structures through C++",** ISRD Group, Tata McGraw Hill Education, 2011.

DATA STRUCTURES USING C++ - LAB

Semester: II **Hours: 3**

Code : 23CS2CP02 **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 Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures in C++.	PSO-1	K1
CO-2	Understand Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures in C++.	PSO-2	K2
CO-3	Apply Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures in C++.	PSO-3	K3
CO-4	Analyze Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures in C++.	PSO-5	K4
CO-5	Evaluate Data Structures, Linear & Non-Linear, Graphs, Advanced Data Structures, Sorting and File Structures in C++.	PSO-4	K5

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

Semester: II			**DATA STRUCTURES USING C++ - LAB**						**Hours: 3**			
Code : 23CS2CP02												**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	2	3	3	5	5	3	3	4	2	3.36
CO-2	2	3	4	5	5	3	3	5	2	3	4	3.55
CO-3	5	3	2	4	4	2	2	4	5	3	2	3.27
CO-4	2	4	5	3	3	3	3	3	2	4	5	3.36
CO-5	3	5	4	3	3	2	2	3	3	5	4	3.36
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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

1. Simple programs in C++
2. Simple programs using classes and objects.
3. C++ Program for One Dimensional and Two-Dimensional Arrays
4. C++ Program for Stack operations
5. C++ program for Queue Operations
6. C++ program for performing Single and Doubly linked lists operations
7. C++ program using functions to perform the following:
   a) Creation of binary search tree of characters.
   b) Traverse the Binary search tree recursively using preorder, in order and post order
8. C++ program for Insertion and sorting to arrange a list of integers in the specified order.
9. Template-based C++ program to arrange a list of elements in an order
   a) selection algorithm b) sort algorithm c) Quick sort

WEB DESIGNING - LAB

Semester: II **Hours: 2**

Code : 23CS2CP03 **Credit: 1**

COURSE OUTCOMES

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember the basic HTML tags, Links, image, List, tables and frames.	PSO -1	K1
CO - 2	Understand HTML tags, Links, image, List, tables and frames.	PSO - 2	K2
CO - 3	Apply HTML tags, Links, image, List, tables and frames.	PSO - 4	K3
CO - 4	Analyze HTML tags, Links, image, List, tables and frames.	PSO - 3	K4
CO - 5	Evaluate HTML tags, Links, image, List, tables and frames.	PSO - 5	K5

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

Semester: II				**WEB DESIGNING - LAB**							**Hours: 2**
Code : 23CS2CP03											**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	2	3	3	3	5	5	3	4	2	3	3.36
CO-2	3	4	3	5	5	3	3	5	3	4	3	3.73
CO-3	4	5	2	3	3	3	3	3	4	5	2	3.36
CO-4	5	3	2	3	3	4	4	3	5	3	2	3.36
CO-5	3	4	5	2	2	3	3	2	3	4	5	3.27
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

1. Working with Internet (Id Creation, Searching)
2. Simple Web Page for Text Formatting
3. Working with colors
4. Web Page with Hyper Links
5. Web Page with Image
6. Web Page with Lists
7. Web Page with Table
8. Web Page with Frames
9. Application Form - Resume Preparation using images
10. Website Creation with necessary validation using scripting language
11. Website for College and Department

GRAPH THEORY AND ITS APPLICATIONS

Semester: II **Hours: 4**

Code : 23CS2AC2A **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 basics of graphs, types of graphs, Matrices and Vector Spaces Associated with Graphs, and its applications.	PSO-1	K1
CO-2	Understand types of graphs, Matrices and Vector Spaces Associated with Graphs, and its applications.	PSO- 3	K2
CO-3	Apply graphs, types of graphs, Matrices and Vector Spaces Associated with Graphs, and its applications.	PSO-4	K3
CO-4	Analyze graphs, types of graphs, Matrices and Vector Spaces Associated with Graphs, and its applications.	PSO- 2	K4
CO-5	Evaluate graphs, types of graphs, Matrices and Vector Spaces Associated with Graphs, and its applications.	PSO- 5	K5

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

Semester: II			GRAPH THEORY AND ITS APPLICATIONS						Hours: 4			
Code : 23CS2AC2A									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	2	3	4	4	5	5	4	3	2	3	3.45
CO-2	5	3	2	4	4	3	3	4	5	3	2	3.45
CO-3	4	5	3	3	3	4	4	3	4	5	3	3.73
CO-4	3	4	2	5	5	4	4	5	3	4	2	3.73
CO-5	4	3	5	2	2	4	4	2	4	3	5	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Basics: Graphs - Pictorial representation - Sub graphs - Isomorphism and degrees - Walk and connected graphs - Cycles in graphs - Cut-vertices and cut- edges.

(12 Hours)

UNIT II

Eulerian and Hamiltonian graphs: Eulerian graphs - Fleury‟s algorithm- Hamiltonian graphs - Weighted graphs. **Bipartite graphs**: Bipartite graphs - Marriage Problem - Trees. **(12 Hours)**

UNIT III

Planar graphs: Euler formula - Platonic solids - Dual of a plane graph - Characterization of planar graphs. **Colourings**: Vertex colouring- Edge colouring- An algorithm for vertex colouring. **(12 Hours)**

UNIT IV

Directed Graphs: Connectivity in digraphs - Strong orientation of graphs - Eulerian digraphs - Tournament - **Matrices and Vector Spaces Associated with Graphs:** Matrix representations - Vector spaces associated with graphs. **(12 Hours)**

UNIT V

Some applications - Connector problem - Weighted graph - Weight - Kruskal's algorithm -Shortest path problem - Dijkstra's algorithm - Transformation - Operands - Images - Closed - Single valued - kinematic graph - Equilibrium basins - Designing one way traffic systems - The Travelling salesman problem - Job sequencing problem**.** **(12 Hours)**

BOOKS FOR STUDY:

1. **"A First Course in Graph Theory",** S. A. Choudum, Macmillan India Ltd., 2013.

   Unit I: Chapter 1: Sections 1.1 - 1.7
   Unit II: Chapter 2 : Sections 2.1 - 2.2 (omitting theorem 2.5), 2.3 , 2.4
   Chapter 3: Sections 3.1 - 3.3
   Unit III: Chapter 5: Sections 5.1 - 5.5
   Chapter 6: Sections 6.1 - 6.3
   Unit IV: Chapter 7: Sections 7.1 - 7.5
   Chapter 4: Sections 4.1 - 4.2
2. **"Invitation to Graph Theory"** S.Arumugam, S. Ramachandran, Scitech Publications (India) PVT. Ltd, Chennai, June 2015.

   Unit V: Chapter XI - (11 .1, 11.2, 11.3, 11.4, 11.5)

BOOKS FOR REFERENCE:

1. **"Graph Theory with Application to Engineering and Computer Science",** Narsingh Deo, Prentice-Hall of India Pvt. Ltd, 2003.
2. **"Graph Theory Applications",** L.R. Foulds, Springer, 2016.

OPTIMIZATION TECHNIQUES

Semester: II **Hours: 4**
Code : 23CS2AC2B **Credit: 4**

COURSE OUTCOMES

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember OR, LPP Mathematical Formulation, Graphical Solution, Simplex Method, Duality in LP, Transportation Problem, Assignment Problem, Network Scheduling By PERT/CPM.	PSO - 1	K1
CO - 2	Understand OR, LPP Mathematical Formulation, Graphical Solution, Simplex Method, Duality in LP, Transportation Problem, Assignment Problem, Network Scheduling By PERT/CPM.	PSO - 2	K2
CO - 3	Apply OR, LPP Mathematical Formulation, Graphical Solution, Simplex Method, Duality in LP, Transportation Problem, Assignment Problem, Network Scheduling By PERT/CPM.	PSO - 3	K3
CO - 4	Analyze OR, LPP Mathematical Formulation, Graphical Solution, Simplex Method, Duality in LP, Transportation Problem, Assignment Problem, Network Scheduling By PERT/CPM.	PSO - 5	K4
CO - 5	Evaluate OR, LPP Mathematical Formulation, Graphical Solution, Simplex Method, Duality in LP, Transportation Problem, Assignment Problem, Network Scheduling By PERT/CPM.	PSO - 4	K5

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

Semester: II			**OPTIMIZATION TECHNIQUES**						**Hours: 4**			
Code : 23CS2AC2B												**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	2	3	3	5	5	3	3	4	2	3.36
CO-2	2	3	4	5	5	3	3	5	2	3	4	3.55
CO-3	5	3	2	4	4	2	2	4	5	3	2	3.27
CO-4	3	2	5	3	3	4	4	3	3	2	5	3.36
CO-5	3	5	4	2	2	3	3	2	3	5	4	3.27
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Operations Research-An Overview: Origin and development of O.R - Nature and Features of O.R - Scientific Method in O.R - Modelling in Operation Research - General Solution Methods for O.R Models - Methodology of Operations Research - Applications of Operations Research - Opportunities and Shortcomings of Operations Research - **Linear Programming Problem Mathematical Formulation**: Introduction -Linear Programming Problem-Mathematical Formulation of the Problem - Illustration on Mathematical Formulation of LPPs - **Linear Programming Problem Graphical Solution and extension**: Introduction - Graphical Solution Method. **(12 Hours)**

UNIT II

Linear Programming problem Simplex Method: Introduction - The Computational Procedure - Use of Artificial Variables - **Duality in Linear Programming:** Introduction - General Primal Dual Pair - Formulating a Dual Problem - Dual Simplex Method. **(12 Hours)**

UNIT III

The Transportation Problem: Introduction - LP Formulation of the Transportation Problem - Duality in Transportation Problem - The Transportation Table - Loops in Transportation Tables - Solution of a Transportation Problem - Finding an Initial Basic Feasible Solution - Test for Optimality-Degeneracy in Transportation Problem - Transportation Algorithm(MODI Method) - Stepping Stone Solution Method - Some Exceptional Cases - Time minimization Transportation Problem-Transshipment Problem. **(12 Hours)**

UNIT IV

Assignment Problem: Introduction - Mathematical Formulation of the Problem - Solution methods of Assignment Problem - Special Cases in Assignment Problem - A typical Assignment Problem - The Traveling Sales Man Problem. **(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)

BOOK FOR STUDY:

1. "**Operations Research**", Kanti Swarup, P.K.Gupta, Man Mohan. Sultan Chad & Sons Publications, New Delhi, 2016.

   UNIT I : Chapters : 1(1.2 -1.5, 1.7,1.8, 1.10, 1.11), 2(2.1- 2.4), 3(3.1, 3.2).

   UNIT II : Chapters : 4 (4.1, 4.3, 4.4), 5(5.1- 5.3, 5.9).

   UNIT III : Chapter : 10 (10.1-10.2, 10.4-10.6, 10.8-10.10, 10.12-10.17).

   UNIT IV : Chapter : 11(11.1-11.5, 11.7).

   UNIT V : Chapter : 25 (25.1-25.4, 25.6-25.8).

BOOKS FOR REFERENCE:

1. **"Operation Research -An Introduction"**, Hamdy A.Taha, 6th edition, PHI., New Delhi-1997
2. **"Linear Programming"**, S. Arumugam and A. Thangapandi Issac, New Gamma Publishing House, Palayamkottai, 2015.

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

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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 சருக்கம்

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

UNIT I: POETRY **12 Hours**

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.

MICROPROCESSOR AND MICROCONTROLLER

Semester: III **Hours: 5**
Code : 23CS3MC05 **Credit: 4**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Introduce 8085 assembly language programming, architecture, 8085 instructions, programming techniques, code conversion, BCD arithmetic, and 16-bit data operations	PSO-1	K1
CO - 2	Understand the 8085 assembly languageprogramming, architecture, 8085 instructions, programming techniques, code conversion, BCD arithmetic, and 16-bit data operations	PSO-2	K2
CO - 3	Apply the 8085 assembly language programming, architecture, 8085 instructions, programming techniques, code conversion, BCD arithmetic, and 16-bit data operations	PSO - 4	K3
CO - 4	Analyze the 8085 assembly language programming, architecture, 8085 instructions, programming techniques, code conversion, BCDarithmetic, and 16-bit data operations	PSO-3	K4
CO - 5	Evaluate 8085 assembly language programming, architecture,8085 instructions, programming techniques, code conversion, BCD arithmetic, and16-bit data operations	PSO-5	K5

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

Semester: III				MICROPROCESSOR AND MICROCONTROLLER								Hours: 5
Code : 23CS3MC05												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	2	3	3	3	5	5	3	4	2	3	3.36
CO - 2	3	3	4	5	5	2	2	5	3	3	4	3.55
CO - 3	4	5	3	3	3	3	3	3	4	5	3	3.55
CO - 4	5	4	3	3	3	2	2	3	5	4	3	3.36
CO - 5	3	2	5	3	3	4	4	3	3	2	5	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Microprocessors, Microcomputers and Assembly Language: Microprocessors - Microprocessor Instruction Set and Computer Languages - From Large Computers to Single Chip Microcontrollers - Application: Microprocessor- Controlled Temperature System. **Introduction to 8085 Assembly Language Programming**: The 8085 Programming Model - Instruction Classification - Instruction, Data Format, and Storage - How to Write, Assemble, and Execute a Simple Program - Overview of the 8085 Instruction Set. **(15 Hours)**

UNIT II

Microprocessor Architecture and Microcomputer Systems: Microprocessor Architecture and its Operations - Memory - Input and Output (I/O) Devices. **8085 Microprocessor Architecture and Memory Interfacing**: The 8085 MPU - Memory Interfacing - Interfacing the 8155 Memory Segment - Testing and Troubleshooting Memory Interfacing Circuits. **(15 Hours)**

UNIT III

Introduction to 8085 Instructions: Data Transfer (Copy) Operations - Arithmetic Operations - Logic Operations - Branch Operations - Writing Assembly Language Programs - Debugging a Problem. **(15 Hours)**

UNIT IV

Programming Techniques with Additional Instructions: Programming Techniques: Looping, Counting, and Indexing - Additional Data Transfer and 16 Bit Arithmetic Instructions - Arithmetic Operations Related to Memory - Logic Operations: Rotate - Logic Operations: Compare - Dynamic Debugging. **Counters and Time Delays:** Counters and Time Delays - Illustrative Program: Hexa Decimal Counter - Illustrative Program: Generating Pulse Waveforms - Debugging Counter and Time Delay Programs. **(15 Hours)**

UNIT V

Stack and Subroutines: Stack - Subroutine - Restart, Conditional Call and Return Instructions**. Code Conversion, BCD Arithmetic, and 16 Bit Data Operations**: BCD to Binary Conversion - Binary to BCD Conversion - BCD to Seven Segment LED Code Conversion - Binary to ASCII and ASCII to Binary Code Conversion - BCD Addition - BCD Subtraction - Multiplication - Subtraction with Carry. **(15 Hours)**

COURSE BOOK

1. Ramesh Gaonkar, **"Microprocessor Architecture, Programming and Applications with the 8085",** PENRAM International Publishing (I) PVT. LTD., Fifth Edition, 2009.

   UNIT I : Chapters: 1, 2.1 - 2.5

   UNIT II : Chapters: 3.1 - 3.3, 4.1, 4.3, 4.4, 4.6

   UNIT III : Chapter: 6.1 - 6.6

   UNIT IV : Chapters: 7, 8

   UNIT V : Chapters: 9.1- 9.3, 10

BOOKS FOR REFERENCE

1. A. K. Ray & K. M. Bhurchandi, **"Advanced Microprocessors and Peripheral - Architectures, Architecture, Programming and Interfacing",** TATA McGrawHill, Second Edition, 2013.
2. **"Introduction to Microprocessor",** A. Mathur, TATA McGrawHill publishingCo. Ltd., Third Edition, 2012.

WEB RESOURCES

- https://onlinecourses.nptel.ac.in/noc20-ee42/preview
- https://archive.nptel.ac.in/courses/108/105/108105102/
- https://www.udemy.com/course/microprocessors-and-microcontrollers/

MICROPROCESSOR AND MICROCONTROLLER-LAB

Semester: III **Hours: 3**
Code : 23CS3CP04 **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 Assembly language programming, arithmetic operations, sorting and searching, code conversion and Simple programs on 8051 Microcontroller.	PSO - 1	K1
CO - 2	Understand the Assemblylanguage programming, arithmetic operations, sorting and searching, code conversion and Simple programs on 8051 Microcontroller.	PSO - 2	K2
CO - 3	Apply the Assembly language programming,arithmetic operations, sorting and searching, code conversion and Simple programs on 8051 Microcontroller.	PSO - 3	K3
CO - 4	Analyze the Assembly language programming, arithmetic operations, sorting and searching, code conversion and Simple programs on 8051 Microcontroller.	PSO - 5	K4
CO - 5	Evaluate the Assembly language programming, arithmetic operations, sorting and searching, code conversion and Simple programs on 8051 Microcontroller.	PSO - 4	K5

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

Semester: III				**MICROPROCESSOR AND MICROCONTROLLER-LAB**							**Hours: 3**
Code : 23CS3CP04											**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	2	3	3	5	5	3	3	4	2	3.36
CO – 2	2	3	4	5	5	3	3	5	2	3	4	3.55
CO – 3	5	3	2	4	4	2	2	4	5	3	2	3.27
CO – 4	2	4	5	3	3	3	3	3	2	4	5	3.36
CO – 5	3	5	4	3	3	2	2	3	3	5	4	3.36
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF PRACTICALS

I Addition and Subtraction

1. 8 - bit addition
2. 16 - bit addition
3. 8 - bit subtraction
4. BCD subtraction

II Multiplication and Division

1. 8 - bit multiplication
2. BCD multiplication
3. 8 - bit division

III Sorting and Searching

1. Searching for an element in an array.
2. Sorting in Ascending and Descending order.
3. Finding the largest and smallest elements in an array.

IV Code Conversion

1. BCD to Hex and Hex to BCD
2. Binary to ASCII and ASCII to binary
3. ASCII to BCD and BCD to ASCII

V Simple programs on 8051 Microcontroller

1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Interfacing Experiments using 8051

VI. Realization of Boolean Expression through ports.

VII. Time delay generation using subroutines.

PHP PROGRAMMING

Semester: III **Hours: 4**

Code : 23CS3AC3A **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 concepts of PHP, Syntax andVariables, Control Structures, Functions, Database, Array, File system, Cookies and Ajax	PSO-1	K1
CO - 2	Understand PHP, Syntax and Variables, Control Structures, Functions, Database, Array, File system, Cookies and Ajax	PSO-2	K2
CO - 3	Apply the Syntax and Variables, Control Structures, Functions, Database, Array, File system, Cookies and Ajax	PSO-4	K3
CO - 4	Analyze the PHP, Syntax and Variables, Control Structures, Functions, Database, Array, File system, Cookies and Ajax	PSO-3	K4
CO - 5	Evaluate the PHP, Syntax and Variables, Control Structures, Functions, Database, Array, File system, Cookies and Ajax	PSO-5	K5

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

Semester: III				PHP PROGRAMMING							Hours: 4
Code : 23CS3AC3A											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	2	3	3	3	5	5	3	4	2	3	3.27
CO - 2	3	4	3	5	5	3	3	5	3	4	3	3.73
CO - 3	4	5	2	3	3	2	2	3	4	5	2	3.18
CO - 4	5	4	2	3	3	4	4	3	5	4	2	3.55
CO - 5	3	4	5	2	2	3	3	2	3	4	5	3.27
Overall Mean Score												3.40

Result: The score for this course is **3.40** (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

Introducing PHP: PHP and MySQL: PHP - MySQL - Deciding on a Web ApplicationPlatform. **Server-Side Scripting Overview:** Static HTML - Client-Side Technologies - Server-Side Scripting. **Getting Started With PHP:** Installing PHP - Installation Procedures - HTML Is Already PHP-Compliant - Escaping From HTML. **Learning PHP Syntax and Variables:** PHP Is Forgiving - HTML Is Not PHP -PHP's Syntax is C-Like - Comments - Variables. Types in PHP - The Simple Types- Output. **(12 Hours)**

UNIT II

Learning PHP Control Structures and Functions: Boolean Expressions - Branching - Looping - Alternate Control Syntaxes - Terminating Execution - Using Functions - Function Documentation - Defining Your Own Function - Functions and Variable Scope - Function Scope**. Passing Information With PHP:** HTTP Is Stateless - GET Arguments - A Better Use for GET-Style URL's - POST Arguments - Formatting Form Variables - PHP Superglobal Arrays. **Learning PHP String Handling:** Strings in PHP - String Functions. **Learning Arrays:** The Uses of Arrays - PHP Arrays - Creating Arrays - Retrieving Values - Multidimensional Arrays -Inspecting Arrays - Deleting from Arrays - Iteration. **Learning PHP Number Handling:** Numerical Types - Mathematical Operators - Simple Mathematical Functions - Randomness. **(12 Hours)**

UNIT III

Introducing Database and MySQL: Database - PHP-Supported Databases - MySQL **Installing MySQL:** Obtaining MySQL - Installing MySQL on Linux - Installing MySQL on Microsoft Windows **Learning Structured Query Language (SQL):** Relational Database and SQL - SQL Standards - The Workhorses of SQL - Database Design - Privileges and Security. **Learning Database Administration and Design:** Basic MySQL Client Commands - MySQL User Administration - Backups - Replication - Recovery. **Integrating PHP and MySQL:** Connecting to MySQL - Making MySQL Queries - Fetching Data Sets - Getting Data About Data - Multiple Connections - Building in Error Checking - Creating MySQL Databases With PHP- MySQL Functions. **(12 Hours)**

UNIT IV

Integrating Web Forms and Databases: HTML Forms - Basic Form Submission toa Database -Self-Submission - Editing Data with an HTML form. **Introducing Object-Oriented PHP:** Object Oriented Programming - Basic PHP Constructs for OOP - Advanced OPP Features - Introspection Functions - Extended Example: HTML Forms - Gotchas and Troubleshooting - OOP Style in PHP. **The Advanced Array Functions:** Transformations of Array - Stacks and Queues -Translating Between Variables and Arrays - Sorting - Printing Functions for Visualizing Arrays. **Working with the Filesystem:** Understanding PHP File Permissions - File Reading and Writing Functions - File System and Directory Functions - Network Functions - Date and Time Functions - Calendar Conversation Functions. **(12 Hours)**

UNIT V

Introduction to PHP and Ajax: Origins and User of PHP - Overview of PHP - General Syntactic Characteristics - Primitives, Operations, and Expressions - Output - Control Statements - Arrays - Functions - Pattern Matching - Form Handling - Cookies - Session Tracking - Overview of Ajax - The Basics of Ajax - Return Document Forms - Ajax Toolkits - Security and Ajax. **(12 Hours)**

COURSE BOOKS

1. Steve Suehring, Tim Converse, and Joyce Park, **"PHP6 and MySQL**", Wiley Publishing, Inc., India, 2015.
   UNIT I: Chapters: 1 - 4
   UNIT II: Chapters: 5 - 9
   UNIT III: Chapters: 11 - 15
   UNIT IV: Chapters: 17, 20, 21, 23
2. Brad Dayley,**" Learning AngularJS",** Pearson Education. Inc. United States of America Edition, 2015.
   UNIT V: Chapters: 7, 9

BOOKS FOR REFERENCE

1. Alan Forbes, "**The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL",** Create space, Independent Publication, Third Edition, 2015.
2. M. Srinivasan, **"Web Programming Building Internet Applications",** Wiley India, Third Edition, 2009.
3. Steven Holzer, **"The Complete Reference PHP",** Mc Graw Hill Indian Edition, 2009.

WEB RESOURCES

- https://onlinecourses.swayam2.ac.in/aic20-sp32/preview
- https://nptelvideos.com/php/php-video-tutorials.php
- https://www.udemy.com/course/learn-php-programming-from-scratch/

UNIX PROGRAMMING

Semester: III **Hours: 4**

Code : 23CS3AC3B **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 background, working with files, directories, command shell, text editing, email, process, scheduling and shell scripting.	PSO-1	K1
CO - 2	Understand the background, working with files, directories, command shell, text editing, email, process, scheduling and shell scripting	PSO-2	K2
CO - 3	Apply the background, working with files,directories, command shell, text editing, email, process, scheduling and shell scripting	PSO-3	K3
CO - 4	Analyze the background, working with files, directories, command shell, text editing, email, process, scheduling and shell scripting	PSO-5	K4
CO - 5	Evaluate the background, working with files, directories, command shell, text editing, email, process, scheduling and shell scripting	PSO-4	K5

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

Semester: III				UNIX PROGRAMMING							Hours: 4
Code : 23CS3AC3B											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	2	4	4	5	5	4	3	3	2	3.45
CO - 2	4	3	2	5	5	3	3	5	4	3	2	3.55
CO - 3	5	2	3	3	3	4	4	3	5	2	3	3.36
CO - 4	3	4	5	3	3	2	2	3	3	4	5	3.36
CO - 5	2	5	4	3	3	2	2	3	2	5	4	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Background: UNIX- UNIX Important - The Structure of the UNIX Operating System Applications - The UNIX Philosophy - The Birth of the UNIX System - GNU and Linux - UNIX Standards - Widely Used UNIX Variants - A UNIX System Timeline - UNIX Contributors - The UNIX System and Microsoft Windows NT Versions - The Future of UNIX - Choosing a UNIX Variant. **(12 Hours)**

UNIT II

Getting Started: Starting Out - Logging In - Entering Commands - Getting Started with Electronic Mail - Logging Out. **Working with Files and Directories:** Directories - The Hierarchical File Structure - UNIX System File Types - CommonCommands for Files and Directories - Searching for Files - More About Listing Files - Permissions - Viewing Long Files - Printing Files. **(12 Hours)**

UNIT III

Command Shell: Running the Shell - Using Wildcards - Standard Input and Output - Running Commands in the Background - Job Control - Configuring the Shell - Shell Variables - Command Aliases - Command History - Command-Line Editing - Command Substitution - Filename Completion - Removing Special Meanings in Command Lines. **(12 Hours)**

UNIT IV

Text Editing: Editing with vi - Editing with emacs - Editing with vim - Editing withpico. **Electronic Mail:** E-Mail on the UNIX System - Command - Line Mail Programs - Screen - Oriented Mail Programs - Graphical Interfaces for E-Mail - Tools for Managing E-Mail. **(12 Hours)**

UNIT V

Processes and Scheduling: Processes - Process Scheduling - Process Priorities -Signals and Semaphores - Real Time Processes. **Shell Scripting:** A Sample Shell Script - Other Ways to Execute Scripts - Putting Comments in Shell Scripts - Working with Variables - Using Command-Line Arguments - Arithmetic Operations - Conditional Execution - Writing Loops - Shell Input and Output - CreatingFunctions - Further Scripting Techniques - Debugging Shell Programs. **(12 Hours)**

COURSE BOOK

1. Kenneth H. Rosen et al., **"The Complete Reference UNIX",** McGraw-Hill, SecondEdition, 2007.

   UNIT I **:** Chapter: 1

   UNIT II **:** Chapters: 2, 3

   UNIT III **:** Chapter: 4

   UNIT IV **:** Chapters: 5, 8

   UNIT V **:** Chapters: 11, 20

BOOKS FOR REFERENCE

1. Brain W. Kernighan and Rob Pike, **"The UNIX Programming Environment",** The Pearson Education India, First Edition, 2015.
2. Eric S. Raymond, Addison, **"The Art of UNIX Programming",** Wesley Educational Publishers Inc, First Edition, 2003.

WEB RESOURCES

- https://onlinecourses.swayam2.ac.in/aic20-sp05/preview
- https://www.udemy.com/course/unix-getting-started/
- https://www.coursera.org/learn/unix

PHP PROGRAMMING-LAB

Semester: III **Hours: 3**

Code : 23CS3AP3A **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember simple programs, control and looping structures, arrays, functions and design a web page with data validation using PHP	PSO-1	K1
CO - 2	Understand simple programs, control and looping structures, arrays, functions and design a web page with data validation using PHP	PSO-2	K2
CO - 3	Apply simple programs, control and looping structures, arrays, functions and design a web page with data validation using PHP	PSO-4	K3
CO - 4	Analyze simple programs, control and looping structures, arrays, functions and design a webpage with data validation using PHP	PSO-5	K4
CO - 5	Evaluate simple programs, control and looping structures, arrays, functions and design a web page with data validation using PHP	PSO-3	K5

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

Semester: III				**PHP PROGRAMMING-LAB**							**Hours: 3**
Code : 23CS3AP3A											**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	2	2	3	3	5	5	3	4	2	2	3.18
CO - 2	3	4	3	5	5	3	3	5	3	4	3	3.73
CO - 3	4	5	2	3	3	2	2	3	4	5	2	3.18
CO - 4	3	4	5	3	3	4	4	3	3	4	5	3.73
CO - 5	5	4	3	2	2	3	3	2	5	4	3	3.27
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

LIST OF PRACTICALS

1. Simple PHP programs using expressions and operators.
2. Programs to demonstrate the usage of control structures
3. Programs using Looping structures
4. Programs using arrays
5. Programs using string functions
6. Simple and parameterized functions
7. Programs using OOPS concepts
8. Program to design a web page using various form controls
9. Data validation in web pages.
10. Using cookies and session variables

ADVANCED EXCEL-LAB

Semester: III **Hours: 1**

Code : 23SE3CS03 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember the basic, date, time and text formulas, creating charts, graphs, filters, Pivot table.	PSO-1	K1
CO - 2	Understand the date, time and text formulas creating charts, graphs, filters, Pivot table.	PSO-2	K2
CO - 3	Apply the date, time and text formulas creating charts, graphs, filters, Pivot table.	PSO-5	K3
CO - 4	Analyze the date, time and text formulas creating charts, graphs, filters, Pivot table.	PSO-3	K4
CO - 5	Evaluate the date, time and text formulas creating charts, graphs, filters, Pivot table.	PSO-4	K5

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

Semester: III				**ADVANCED EXCEL-LAB**							**Hours: 1**
Code : 23SE3CS03											**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	2	4	4	4	5	5	4	3	2	4	3.64
CO - 2	4	3	2	5	5	3	3	5	4	3	2	3.55
CO - 3	2	3	5	3	3	4	4	3	2	3	5	3.36
CO - 4	5	4	2	2	2	2	2	2	5	4	2	2.91
CO - 5	3	5	3	4	4	3	3	4	3	5	3	3.64
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

LIST OF PRACTICALS

1. Using Formulas -VLOOKUP, COUNTIFS, COUNT, IF, COUNTIF, COUNTIFS
2. Using Date, Time and Text Functions
3. Formatting reports using Charts and Graphs
4. User defined groups, adding/removing, subtotals
5. Using formulas on pivoted data
6. Displaying multiple row labels in columns, or tabular form
7. Expanding Filter Results to Individual Tabs
8. Using Filters - Quick Filtering, Filtering by Multiple Criteria, Saving the filtereddata, Performing Calculations on Filtered Data
9. PivotTable - Adding row labels, adding column data, changing formulas in columns, changing headers & number formats
10. PivotTable Report - Adding multiple row labels, collapsing and expanding, drilldown to data, sorting, & refreshing.
11. Pivot Table Report - Grouping by dates, grouping by ranges, show items with nodetail, show values in empty cells, grouping across columns

MARKUP AND SCRIPTING LANGUAGES-LAB

Semester: III **Hours: 2**

Code : 23CS3GE01 **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 HTML, CSS, JavaScript and VBScript codes.	PSO-1	K1
CO - 2	Understand the HTML, CSS, Java Script and VBScript codes.	PSO-2	K2
CO - 3	Apply the HTML, CSS, Java Script and VBScript codes.	PSO-4	K3
CO - 4	Analyze the HTML, CSS, Java Script and VBScript codes.	PSO-3	K4
CO - 5	Evaluate the HTML, CSS, Java Script and VBScript codes.	PSO-5	K5

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

Semester: III			**MARKUP AND SCRIPTING LANGUAGES-LAB**								**Hours: 2**
Code : 23CS3GE01											**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	3	3	4	4	5	5	4	4	3	3	3.82
CO - 2	2	3	4	5	5	4	4	5	2	3	4	3.73
CO - 3	3	5	3	2	2	3	3	2	3	5	3	3.09
CO - 4	5	3	2	3	3	4	4	3	5	3	2	3.36
CO - 5	2	3	5	4	4	3	3	4	2	3	5	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

LIST OF PRACTICALS

1. Create a basic web page using all formatting tags
2. Create a static webpage using table tags of HTML
3. Create a static web page which defines all text formatting tags of HTML in tabularformat.
4. Create webpage using list tags of HTML
5. Create webpage to include image using HTML tag
6. Create employee registration webpage using HTML form objects
7. Create an Application Form using HTML
8. Dynamic Website Creation (College, Department)
9. Personal Webpage creation using Style Sheets
10. Simple programs using JavaScript
11. Webpage creation using JavaScript
12. Simple programs using VBScript
13. Validating form elements using VBScript

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 of 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 ecosystems. **(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

JAVA PROGRAMMING

Semester: IV **Hours: 4**

Code : 23CS4MC06 **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 basics of Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptions and Applet.	PSO-1	K1
CO - 2	Understand the concepts of Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptions and Applet.	PSO-2	K2
CO - 3	Apply the concepts of Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptions and Applet.	PSO-3	K3
CO - 4	Analyze the concepts of Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptions and Applet.	PSO-4	K4
CO - 5	Evaluate the concepts of Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptions and Applet.	PSO-5	K5

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

Semester: IV				**JAVA PROGRAMMING**							**Hours: 4**
Code : 23CS4MC06											**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	2	3	2	3	3	5	5	3	2	3	2	3.00
CO - 2	2	4	3	5	5	4	4	5	2	4	3	3.73
CO - 3	5	3	4	3	3	4	4	3	5	3	4	3.73
CO - 4	4	5	3	4	4	4	4	4	4	5	3	4.18
CO - 5	3	2	5	3	3	3	3	3	3	2	5	3.18
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

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 - Labeled Loops. **(12 Hours)**

UNIT III

Classes, Objects and Methods: Defining a Class - FieldsDeclaration - 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.

(12 Hours)

COURSE BOOK

1. E. Balagurusamy, **"Programming with JAVA A Primer",** Tata McGrawHill 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

BOOKS FOR REFERENCE

1. Herbert Schildt, **"The Complete reference Java 2",** McGraw Hill Education (India) Private Ltd, Fifth Edition, 2015.
2. Dr. R. Nageswara Rao, **"Core Java - An Integrated Approach",** Dream Tech Press, 2017.

WEB RESOURCES

1. https://onlinecourses.nptel.ac.in/noc20-cs58/preview
2. https://onlinecourses.nptel.ac.in/noc23-cs74/preview
3. https://www.udemy.com/course/java-se-programming/

DIGITAL COMPUTER FUNDAMENTALS

Semester: IV **Hours: 3**
Code : 23CS4MC07 **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 Digital Principles, Digital Logic, Combinational Logic Circuits, Data Processing Circuits, Number System and Codes, Arithmetic Circuits, Flip-Flops, Registers, Counters, Memory.	PSO-1	K1
CO - 2	Understand the Digital Principles, Digital Logic, Combinational Logic Circuits, Data Processing Circuits, Number System and Codes, Arithmetic Circuits, Flip-Flops, Registers, Counters, Memory.	PSO-2	K2
CO - 3	Apply the Digital Principles, Digital Logic, Combinational Logic Circuits, Data Processing Circuits, Number System and Codes, Arithmetic Circuits, Flip-Flops, Registers, Counters, Memory.	PSO - 4	K3
CO - 4	Analyze the Digital Principles, Digital Logic, Combinational Logic Circuits, Data Processing Circuits, Number System and Codes, Arithmetic Circuits, Flip-Flops, Registers, Counters, Memory.	PSO-3	K4
CO - 5	Evaluate the Digital Principles, Digital Logic, Combinational Logic Circuits, Data Processing Circuits, Number System and Codes, Arithmetic Circuits, Flip-Flops, Registers, Counters, Memory.	PSO-5	K5

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

Semester: IV			**DIGITAL COMPUTER FUNDAMENTALS**								**Hours: 3**
Code : 23CS4MC07											**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	2	3	3	3	5	5	3	4	2	3	3.36
CO - 2	3	3	4	5	5	2	2	5	3	3	4	3.55
CO - 3	4	5	3	3	3	3	3	3	4	5	3	3.55
CO - 4	5	4	3	3	3	2	2	3	5	4	3	3.36
CO - 5	3	2	5	3	3	4	4	3	3	2	5	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

Digital Principles: Digital Logic - Digital Computer - Digital Integrated Circuits. **Digital Logic:** The Basic Gates - NOT, OR, AND - Universal Logic Gates-NOR, NAND. **(9 Hours)**

UNIT II

Combinational Logic Circuits: Boolean Laws and Theorems - Sum-of-Products Method -Truth Table to Karnaugh Map - Product-of-sums Method. **Data Processing Circuits:** Multiplexers - Demultiplexers -1-of-16 Decoder - Encoders - Parity Generators and Checkers. **(9 Hours)**

UNIT III

Number System and Codes: Binary Number System - Binary-to-decimal Conversion - Decimal-to-binary Conversion. **Arithmetic Circuits:** Binary Addition - Binary Subtraction - Unsigned Binary Numbers - Sign-magnitude Numbers - 2's Complement Representation - 2's Complements Arithmetic - Arithmetic Building Blocks - The Adder - Subtractor. **(9 Hours)**

UNIT IV

Flip-Flops: RS FLIP-FLOPs - Gated FLIP-FLOPs - Edge-triggered RS FLIP-FLOPs - Edge-triggered D FLIP FLOPs - Edge-triggered JK FLIP FLOPs - JK Master-slave FLIP-FLOPs. **Registers.** **(9 Hours)**

UNIT V

Counters: Asynchronous Counters - Synchronous Counters. **Memory:** Basic Terms and Ideas - Memory Read and Write - ROMs, PROMs, and EPROMs - RAMs. **(9 Hours)**

COURSE BOOK

1. TMH D.P Leach, A.P. Malvino, Goutam Saha, "**Digital Principles and Applications,** McGraw Hill Education, Eighth Edition, 2016.

UNIT I : Chapters: 1.3, 1.6, 1.7, 2.1, 2.2.

UNIT II : Chapters: 3.1 - 3.3, 3.7, 4.1- 4.3, 4.6, 4.8

UNIT III : Chapters: 5.1, 5.3, 5.5, 6.1 - 6.8

UNIT IV : Chapters: 8.1 - 8.5, 8.8, 9

UNIT V : Chapters: 10.1, 10.3, 13.1 -13.5.

BOOKS FOR REFERENCE

1. J. S. Katre, Srictly, **"Digital Fundamentals",** Gujarat Technological UniversityW.E.F, Academic year 2019-2020.
2. J.S. Katre, Savitribai**, "Fundamentals of Digital Electronics",** Phule PuneUniversity w.e.f. from academic year 2019-2020.
3. T.C. Bartee, **"Digital Computer Fundamentals",** Tata McGraw Hill, Sixth Edition, 1991.

WEB RESOURCES

1. https://www.udemy.com/course/computer-organization-and-architecture-course-masterclass/
2. https://www.udemy.com/course/computer-forensics-and-digital-forensics-for-everyone/
3. https://www.udemy.com/course/computer-fundamentals-for-bigginners/

CLOUD COMPUTING

Semester: IV **Hours: 4**
Code : 23CS4AC4A **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 Cloud Models, Concepts & Technologies, Services, Application Design, Cloud Security and Cloud Computing for Education	PSO-1	K1
CO - 2	Understand the Cloud Models, Concepts & Technologies, Services, Application Design, Cloud Security and Cloud Computing for Education	PSO-2	K2
CO - 3	Apply the Cloud Models, Concepts & Technologies, Services, Application Design, Cloud Security and Cloud Computing for Education	PSO-3	K3
CO - 4	Analyze the Cloud Models, Concepts & Technologies, Services, Application Design, Cloud Security and Cloud Computing for Education	PSO-5	K4
CO - 5	Evaluate the Cloud Models, Concepts & Technologies, Services, Application Design, Cloud Security and Cloud Computing for Education	PSO-4	K5

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

Semester: IV				**CLOUD COMPUTING**							**Hours: 4**
Code : 23CS4AC4A											**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	2	3	4	4	5	5	4	3	2	3	3.45
CO - 2	3	3	2	5	5	4	4	5	3	3	2	3.55
CO - 3	5	3	3	4	4	3	3	4	5	3	3	3.64
CO - 4	4	4	5	3	3	4	4	3	4	4	5	3.91
CO - 5	3	5	4	3	3	4	4	3	3	5	4	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

Introduction to Cloud Computing: Definition of Cloud Computing - Characteristics of Cloud Computing - Cloud Models - Cloud Service Examples - Cloud-based Services and Applications. **Cloud Concepts and Technologies:** Virtualization - Load balancing - Scalability and Elasticity - Deployment - Replication - Monitoring - Software Defined Networking - Network Function Virtualization - Map Reduce - Identity and Access Management - Service Level Agreements - Billing. **(12 Hours)**

UNIT II

Cloud Services & Platforms: Compute Services - Amazon Elastic Computer Cloud Google Compute Engine - Windows Azure Virtual Machines. **Storage Services:** Amazon Simple Storage Service - Google Cloud Storage - Windows Azure Storage **Database Services:** Amazon Relational Data Store - Amazon Dynamo DB - Google Cloud SQL - Google Cloud Data Store - Windows Azure SQL Database - Windows Azure Table Service - **Application Services:** Application Runtimes and Frameworks - Queuing Services - Email Services - Notification Services - Media Services - **Content Delivery Services:** Amazon Cloud Front - Windows Azure Content Delivery Network - **Analytics Services:** Amazon Elastic Map Reduce - Google Map Reduce Service - Google Big Query - Windows Azure HDInsight - **Deployment and Management Services:** Amazon Elastic Beanstalk - Amazon Cloud Formation - **Identity and Access Management Services:** Amazon Identityand Access Management - Windows Azure Active Directory. **Open-Source Private Cloud Software:** Cloud Stack - Eucalyptus - OpenStack. **(12 Hours)**

UNIT III

Cloud Application Design: Introduction - Design Consideration for Cloud Applications - Scalability - Reliability and Availability - Security -Maintenance and Upgradation - Performance - Reference Architectures for Cloud Applications - Cloud Application Design Methodologies - Service Oriented Architecture (SOA) - Cloud Component Model - IaaS, PaaS and SaaS Services for Cloud Applications - Model View Controller (MVC) - RESTful Web Services - Data Storage Approaches:Relational Approach (SQL) - Non-Relational Approach (NoSQL). **(12 Hours)**

UNIT IV

Cloud Application Benchmarking and Tuning: Introduction to Benchmarking - Steps in Benchmarking - Workload Characteristics - Application Performance Metrics - Design Consideration for Benchmarking Methodology - Benchmarking Tools - Types of Tests - Deployment Prototyping - **Cloud Security:** Introduction - CSA Cloud Security Architecture - Authentication (SSO) - Authorization - Identity and Access Management - Data Security - Securing Data at Rest - Securing Data in Motion - Key Management - Auditing. **(12 Hours)**

UNIT V

Case Studies: 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

1. Arshdeep Bahga, Vijay Madisetti, "**Cloud Computing - A Hands on Approach",** Universities Press (India) Pvt. Ltd., 2018.

   UNIT I : Chapters 1, 2

   UNIT II : Chapter 3

   UNIT III : Chapter 5

   UNIT IV : Chapters 11,12

   UNIT V : Chapter 13

BOOKS FOR REFERENCE

1. Anthony T Velte, Toby J Velte, RobertElsenpeter, **"Cloud Computing: A Practical Approach"**, Tata McGraw-Hill, 2013.
2. Barrie Sosinsky, **"Cloud Computing Bible"**, Wiley India Pvt. Ltd., 2013.
3. David Crookes, **"Cloud Computing in Easy Steps",** Tata McGraw Hill, 2012.

WEB RESOURCES

1. https://onlinecourses.nptel.ac.in/noc21-cs14/preview
2. https://coursevise.com/cloud-computing/cloud-computing-courses-udemy/#2
3. https://www.udemy.com/topic/cloud-computing/

BIG DATA ANALYTICS

Semester: IV **Hours: 4**
Code : 23CS4AC4B **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 technologies for Data in DB, Data Warehouses, NoSQL Data Management, Analytics and Big Data, Analytical Approaches & Functions, Packages in R, Data Visualization.	PSO - 1	K1
CO - 2	Understand the technologies for Data in DB, Data Warehouses, NoSQL Data Management, Analytics and Big Data, Analytical Approaches & Functions, Packages in R, Data Visualization.	PSO - 2	K2
CO - 3	Analyze the technologies for Data in DB, Data Warehouses, NoSQL Data Management, Analytics and Big Data, Analytical Approaches & Functions, Packages in R, Data Visualization.	PSO - 4	K3
CO - 4	Apply the technologies for Data in DB, Data Warehouses, NoSQL Data Management, Analytics and Big Data, Analytical Approaches & Functions, Packages in R, Data Visualization.	PSO - 3	K4
CO - 5	Evaluate the technologies for Data in DB, Data Warehouses, NoSQL Data Management, Analytics and Big Data, Analytical Approaches & Functions, Packages in R, Data Visualization.	PSO - 5	K5

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

Semester: IV				BIG DATA ANALYTICS							Hours: 4
Code : 23CS4AC4B											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	2	2	4	4	5	5	4	3	2	2	3.27
CO - 2	3	2	2	5	5	4	4	5	3	2	2	3.36
CO - 3	3	5	3	4	4	4	4	4	3	5	3	3.82
CO - 4	5	3	3	3	3	4	4	3	5	3	3	3.55
CO - 5	3	3	5	3	3	4	4	3	3	3	5	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Getting an Overview of Big Data: Big Data - 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 Datain 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. **(12 Hours)**

UNIT II

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. **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. **(12 Hours)**

UNIT III

NoSQL Data Management: Introduction to NoSQL - Types of NoSQL Data Models - Schema-Less Databases - Materialized Views - Distribution Models - Sharding. **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 Graphs 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. **(12 Hours)**

UNIT V

Data Visualization with Tableau (Data Visualization-II): Introduction to Tableau Software -Tableau Desktop Workspace - Data Analytics in Tableau Public - UsingVisual Controls in Tableau Public - Overview of Tableau 9.0. **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. **(12 Hours)**

COURSE BOOK

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

UNIT I	**:**	Chapters: 1, 2
UNIT II	**:**	Chapters: 3, 6, 7
UNIT III	**:**	Chapters: 15, 18, 19
UNIT IV	**:**	Chapters: 23, 24, 26
UNIT V	**:**	Chapters: 27, 28

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"**, PearsonEducation, 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=b ig+data+analytics
3. https://www.udemy.com/course/python-big-data-analytics-and-data-science/

JAVA PROGRAMMING-LAB

Semester: IV **Hours: 3**

Code : 23CS4CP05 **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 Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptions and Applet.	PSO-1	K1
CO - 2	Understand the concepts of Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptions and Applet.	PSO-2	K2
CO - 3	Apply the concepts of Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptionsand Applet.	PSO-3	K3
CO - 4	Analyze the concepts of Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptionsand Applet.	PSO-5	K4
CO - 5	Evaluate the concepts of Java, Programming Environment, Structures, Objects and Classes, Inheritance, Interfaces, Exceptionsand Applet.	PSO-4	K5

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

Semester: IV				JAVA PROGRAMMING-LAB								Hours: 3
Code : 23CS4CP05												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	3	4	4	5	5	4	3	3	3	3.64
CO - 2	3	2	4	5	5	3	3	5	3	2	4	3.55
CO - 3	5	3	3	3	3	3	3	3	5	3	3	3.36
CO - 4	3	4	5	3	3	3	3	3	3	4	5	3.55
CO - 5	3	5	3	2	2	3	3	2	3	5	3	3.09
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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

LIST OF PRACTICALS

1. **Simple class**
   - **a.** Number Checking (Prime, Perfect, Palindrome, Armstrong, Adam)
   - **b.** Number Generation (Prime, Perfect, Palindrome, Fibonacci)
2. **Arrays and control structures**
   - **a.** Number Sorting and Searching
   - **b.** Matrix Manipulation (Addition, Subtraction and Transpose)
3. **String Methods**
   - **a.** String Sorting and Searching
   - **b.** Program using string methods
4. **Inheritance**
   - **a.** Staff information System
   - **b.** Railway Reservation
5. **Package & Interface**
   - **a.** Mark Sheet Processing
   - **b.** Employee Details using Interface
6. **Exception Handling and Threads**
   - **a.** Programs using built in and user defined Exceptions
   - **b.** Program using Multithreading
7. **Applets and Files**
   - **a.** Program Using Applet
   - **b.** Draw a Human Face using Applet
   - **c.** Counting no of Lines, Words and Characters in a File

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	2	2	5	5	2	3	4	3	3.27
CO-2	3	3	4	5	5	4	4	5	3	3	4	3.73
CO-3	5	3	3	4	4	3	3	4	5	3	3	3.64
CO-4	3	5	3	3	3	4	4	3	3	5	3	3.55
CO-5	3	4	5	2	2	3	3	2	3	4	5	3.27
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

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

ANIMATION USING FLASH-LAB

Semester: IV **Hours: 2**

Code : 23CS4GE02 **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-2	K2
CO - 3	Apply the concepts of multimedia, Images, Frameby Frame Animation, Tween, Mask, Text, Sound Effects.	PSO-3	K3
CO - 4	Analyze the concepts of multimedia, Images, Frame by Frame Animation, Tween, Mask, Text, Sound Effects.	PSO-4	K4
CO - 5	Evaluate the concepts of multimedia, Images, Frame by Frame Animation, Tween, Mask, Text, Sound Effects.	PSO-5	K5

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

Semester: IV			**ANIMATION USING FLASH-LAB**								**Hours: 2**
Code : 23CS4GE02											**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	3	3	3	5	5	3	3	3	3	3.36
CO - 2	3	2	4	5	5	3	3	5	3	2	4	3.55
CO - 3	5	3	3	3	3	4	4	3	5	3	3	3.55
CO - 4	3	5	3	3	3	4	4	3	3	5	3	3.55
CO - 5	3	3	5	2	2	3	3	2	3	3	5	3.09
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

LIST OF PRACTICALS

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

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**

COMPUTER NETWORKS

Semester: V **Hours: 4**

Code : 23CS5MC08 **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 Network models, Physical, Datalink, Medium Access Control, Network, Transport, Application Layers.	PSO-1	K1
CO - 2	Understand the Network models, Physical, Datalink, Medium Access Control, Network, Transport, Application Layers.	PSO-2	K2
CO - 3	Apply the Network models, Physical, Datalink, Medium Access Control, Network, Transport, Application Layers.	PSO-4	K3
CO - 4	Analyze the Network models, Physical, Datalink, Medium Access Control, Network, Transport, Application Layers.	PSO-3	K4
CO - 5	Evaluate the Network models, Physical, Datalink, Medium Access Control, Network, Transport, Application Layers.	PSO-5	K5

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

Semester: V				COMPUTER NETWORKS							Hours: 4
Code : 23CS5MC08											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	4	4	5	5	4	3	3	3	3.64
CO - 2	3	3	2	5	5	3	3	5	3	3	2	3.18
CO - 3	3	5	3	3	3	4	4	3	3	5	3	3.73
CO - 4	5	3	4	4	4	4	4	4	5	3	4	4.00
CO - 5	3	4	5	3	3	3	3	3	3	4	5	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Introduction: Uses of Computer Networks - Network Hardware - Network Software -Reference Models - Example Networks - Network Standardization. **(12 Hours)**

UNIT II

The Physical Layer: Guided Transmission Media - Wireless Transmission- Communication Satellites - Digital Modulation and Multiplexing - The Public Switched Telephone Network - The Mobile Telephone System - Cable Television. (**12 Hours)**

UNIT III

The Data Link Layer: Data Link Layer Design Issues - Error Detection and Correction - Elementary Data Link Protocols - Sliding Window Protocols - Example Data Link Protocols. **The Medium Access Control Sublayer:** The Channel Allocation Problem - Multiple Access Protocols - Ethernet - Wireless LANS - Broadband Wireless - Bluetooth -RFID - Data Link Layer Switching. **(12 Hours)**

UNIT IV

Network Layer: Network Layer Design Issues - Routing Algorithms - Congestion ControlAlgorithms - Quality of Service - Internetworking. **The Transport Layer:** The TransportService - Elements of Transport Protocols - Congestion Control - The Internet TransportProtocols: UDP - The Internet Transport Protocols: TCP. **(12 Hours)**

UNIT V

The Application Layer: DNS (The Domain Name System) - Electronic Mail - The World Wide Web- Streaming Audio and Video - Content Delivery. **(12 Hours)**

COURSE BOOK

1. Andrew S. Tanenbaum, David J. Wetherall, **"Computer Networks",** Pearson Education Inc., Dorling Kindersley (India) Private Limited, Fifth Edition, 2014.

UNIT I	**:**	Chapter: 1
UNIT II	**:**	Chapter: 2
UNIT III	**:**	Chapters: 3, 4
UNIT IV	**:**	Chapters: 5, 6
UNIT V	**:**	Chapter: 7

BOOKS FOR REFERENCE

1. Larry L. Peterson and Bruce S. Davie, **"Computer Networks a Systems Approach",** Fifth Edition, Reprint, 2014.
2. Bhushan Trivedi, **"Computer Networks",** OXFORD University Press, 2011.
3. Dr. Sanjay Sharma, **"Principles of Computer Networks",** S.K. Kataria & Sons Publication, First Edition, 2014.

WEB RESOURCES

1. https://onlinecourses.nptel.ac.in/noc20-cs23/preview
2. https://onlinecourses.nptel.ac.in/noc23-cs35/preview
3. https://www.udemy.com/topic/Computer-Network/

.NET PROGRAMMING

Semester: V **Hours: 4**

Code : 23CS5MC09 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-1	K1
CO - 2	Understand .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-2	K2
CO - 3	Apply .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-4	K3
CO - 4	Analyze .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-3	K4
CO - 5	Evaluate .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-5	K5

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

Semester: V				.NET PROGRAMMING							Hours: 4
Code : 23CS5MC09											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	3	3	3.36
CO - 2	3	3	3	5	5	4	4	5	3	3	3	3.73
CO - 3	3	5	3	3	3	3	3	3	3	5	3	3.36
CO - 4	5	3	3	3	3	3	3	3	5	3	3	3.36
CO - 5	3	4	5	3	3	3	3	3	3	4	5	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

ASP.NET Introduction: The .NET Framework - The Common Language Runtime - The .NET Class Library - ASP.NET - Visual Studio .NET. **Learning the .NET Languages:** The .NET Languages - Data Types - Declaring Variables - Scope and Accessibility - Variable Operations - Conditional Structures - Loop Structures - Functions and Subroutines. **Setting Up ASP.NET and IIS:** Installing IIS - IIS Manager - Installing ASP.NET. **(12 Hours)**

UNIT II

Web Form Fundamentals: A Simple Page Applet - The Page Class. **Web Controls:** Stepping Up to Web Controls - Web Control Classes - A Simple Web Page Applet - Assessing Web Controls. **Using Visual Studio .NET:** Starting a Visual Studio .NET Project - The Web Form Designer - Writing Code - Visual Studio .NET Debugging. **(12 Hours)**

UNIT III

Validation and Rich Controls: Validation - A Simple Validation Example - Validated Customer Form - Other Rich Controls. **State Management:** View state - Custom Cookies - Session State - Session State Configuration - Application State. **Tracing, Logging and Error Handling:** Common Errors - The .NET Exception Object - Handling Exceptions - Throwing Your Own Exceptions - Logging Exceptions - Error Pages - Page Tracing. **(12 Hours)**

UNIT IV

Overview of ADO.NET: Introducing ADO.NET and Data Management - Characteristics of ADO.NET - The ADO.NET Object Model. **ADO.NET Data Access:** SQL Basics - The SQL Select, Insert, Update, Delete Statement - Creating a Connection. **Data Binding:** Introduction to Data Binding - Single-Value Data Binding - Repeated-Value Data Binding -Data Binding with Databases. **(12 Hours)**

UNIT V

The Data List, Data Grid, and Repeater: Using Templates with the Data List - Data Binding with Multiple Templates - Comparing the Template Controls - Selecting Items - Editing Items - Paging with the Data Grid - Sorting with the Data Grid. **Using XML:** XML‟s Hidden Role in .NET - XML Explained - The XML Classes - XML Validation - XML Display and Transforms - XML in ADO.NET.

(12 Hours)

COURSE BOOK

1. Mathew Mac Donald, **"The Complete Reference ASP.NET",** Tata McGraw-Hill, 2017.

UNIT I	**:**	Chapters: 1, 2, 4
UNIT II	**:**	Chapters: 6-8
UNIT III	**:**	Chapters: 9-11
UNIT IV	**:**	Chapters: 12-14
UNIT V	**:**	Chapters: 15, 17

BOOKS FOR REFERENCE

1. Herbert Schildt, **"The Complete Reference C#.NET",** Tata McGraw-Hill, 2017.
2. Kogent Learning Solutions, "**C# 2012 Programming Covers .NET 4.5 Black Book",** Dreamtech Press, 2013.
3. Anne Boehm, Joel Murach, Murach"s, **"C# 2015",** Mike Murach & Associates Inc. 2016.
4. Denielle Otey, Michael Otey, **"ADO.NET: The Complete reference"**, McGraw Hill,2008.
5. Matthew MacDonald, **"Beginning ASP.NET 4 in C# 2010"**, APRESS, 2010.

WEB RESOURCES

1. https://www.udemy.com/course/c-net-for-beginners/
2. https://www.udemy.com/topic/aspnet/
3. https://www.coursera.org/learn/c-sharp-for-dot-net

ADVANCED DATABASE MANAGEMENT SYSTEMS

Semester: V **Hours: 4**

Code : 23CS5MC10 **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, Database System, data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQL programs.	PSO-1	K1
CO - 2	Understand Database System, data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQL programs.	PSO-2	K2
CO - 3	Apply data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQL programs.	PSO-3	K3
CO - 4	Analyze data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQLprograms.	PSO-5	K4
CO - 5	Evaluate data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQL programs.	PSO-4	K5

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

Semester: V				**ADVANCED DATABASE MANAGEMENT SYSTEMS**							**Hours: 4**
Code : 23CS5MC10											**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	3	3	3	4	3.55
CO - 2	3	3	3	5	5	3	3	5	3	3	3	3.55
CO - 3	5	3	3	3	3	4	4	3	5	3	3	3.55
CO - 4	4	3	5	3	3	4	4	3	4	3	5	3.73
CO - 5	3	5	4	3	3	3	3	3	3	5	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

Database Concepts: Database Systems - Data Vs Information - Introducing the database - Database Design Is Important - Evolution of File System Data Processing - Problems withFile System Data Processing - Database Systems. **Data Models:** Data Modeling and Data Models - The Importance of Data Models - Data Model Basic Building Blocks - Evolution of Data Models - Degrees of Data Abstraction. **(12 Hours)**

UNIT II

Design Concepts: The Relational Database Model: A Logical View of Data - Keys - Integrity Rules - Relational Set Operators - Data Dictionary and the System Catalog - Relationships within the Relational Database - Data Redundancy Revisited -Indexes - Codd's Relational Database Rules. **Entity Relationship (ER) Modeling:** Entity Relationship Model (ERM) - Developing an ER Diagram - Database Design Challenges: Conflicting Goals. **(12 Hours)**

UNIT III

Normalization of Database Tables: Database Tables and Normalization - The Need for Normalization -The Normalization Process - Improving the Design- Surrogate Key Considerations - Higher-Level Normal Forms - Normalization and Database Design -Denormalization. **Introduction to SQL:** The Data Definition Commands - Data Manipulation Commands - SELECT Queries - Additional Data Definition Commands - Additional SELECT Query Keywords- Virtual Tables: Creating a View - Joining Database Tables. **(12 Hours)**

UNIT IV

Advanced SQL: Relational Set Operators - SQL Join Operators - Subqueries and Correlated Queries - SQL Function - Oracle Sequences - Updated Views - Procedural SQL - Embedded SQL. Data Definition Commands - Creating Table Structures - Altering Table Structures - Data Manipulation Commands - Virtual Tables: Creating a View - Sequences - Procedural SQL - Embedded SQL. **(12 Hours)**

UNIT V

PL/SQL:A Programming Language: A Brief History of PL/SQL - Fundamentals of PL/SQL - PL/SQL 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 Statement. **PL/SQL Cursors and Exceptions:** Cursors - Implicit Cursors - Explicit Cursors - Explicit Cursor Attributes - Implicit Cursor Attributes - Cursor FOR Loops - SELECT…FOR UPDATE Cursor - WHERE CURRENT OF Clause - Cursor with Parameters - Cursor Variables - Exceptions - Types of Exceptions. **(12 Hours)**

COURSE STUDY

1. Coronel, Morris,Rob, **"Database Systems, Design, Implementation and Management",** Ninth Edition, 2011.

   UNIT I: Chapters: 1, 2

   UNIT II: Chapters: 3, 4

   UNIT III: Chapters: 6, 7

   UNIT IV: Chapter: 8

2. Nilesh Shah, **"Database Systems Using Oracle",** Pearson Education India, Second Edition, Reprint, 2016.

   UNIT V: Chapters: 10-12

BOOKS FOR REFERENCE

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, **"Database System Concepts",** McGraw Hill International Publication, Seventh Edition.
2. Shio Kumar Singh, **"Database Systems",** Pearson Publications, Second Edition.

WEB RESOURSES

1. https://www.udemy.com/course/database-management-systems/
2. https://www.udemy.com/course/database-management-system-course/
3. https://www.udemy.com/course/relational-database-management-systemrdbms- complete-pack/
4. https://www.udemy.com/course/complete-sql-course-qadata-analyticsbusiness- intelligence/
5. https://www.udemy.com/course/fairysql-query-writing-for-beginners/
6. https://onlinecourses.nptel.ac.in/noc21-cs04/preview

.NET PROGRAMMING-LAB

Semester: V **Hours: 4**

Code : 23CS5CP06 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-1	K1
CO - 2	Understand .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-2	K2
CO - 3	Apply .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-3	K3
CO - 4	Analyze .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-5	K4
CO - 5	Evaluate .NET framework, .NET languages, Validation and Rich controls, Error Handling, Data List, Data Grid, Repeater and XML.	PSO-4	K5

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

Semester: V				**.NET PROGRAMMING-LAB**							**Hours: 4**
Code : 23CS5CP06											**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	3	3	3	5	5	3	3	3	3	3.36
CO - 2	3	3	3	5	5	3	3	5	3	3	3	3.55
CO - 3	5	3	3	3	3	3	3	3	5	3	3	3.36
CO - 4	4	3	5	3	3	3	3	3	4	3	5	3.55
CO - 5	3	5	3	3	3	3	3	3	3	5	3	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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF PRACTICALS

1. Create an exposure of Web applications and tools
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. Validate user input using Validation controls.

WORKING WITH FILE CONCEPTS

7. Web application using Data Controls.
8. Data binding with Web controls
9. Data binding with Data Controls.
10. Database application to perform insert, update and delete operations.
11. Database application using Data Controls to perform insert, delete, edit, paging andsorting operation.
12. Implement the XML classes.
13. Implement Authentication - Authorization.
14. Ticket reservation using ASP.NET controls.
15. Online examination using ASP.NET controls

ADVANCED DBMS-LAB

Semester: V **Hours: 4**

Code : 23CS5CP07 **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 basic concepts, Database System, data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQL programs.	PSO-1	K1
CO - 2	Understand Database System, data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQL programs.	PSO-3	K2
CO - 3	Apply data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQL programs.	PSO-2	K3
CO - 4	Analyze data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQLprograms.	PSO-4	K4
CO - 5	Evaluate data models, E-R Model, SQL, retrieving of data using DML and Database operations using PL/SQL programs.	PSO-5	K5

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

Semester: V				**ADVANCED DBMS-LAB**							**Hours: 4**
Code : 23CS5CP07											**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	5	3	3	3	3	3	3	3	5	3	3	3.36
CO - 3	3	3	4	5	5	4	4	5	3	3	4	3.91
CO - 4	3	5	3	3	3	3	3	3	3	5	3	3.36
CO - 5	3	4	5	3	3	4	4	3	3	4	5	3.73
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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

LIST OF PRACTICALS

I. SQL

1. DDL Commands
2. DML Commands
3. TCL Commands

II. PL/SQL

4. Fibonacci Series
5. Factorial
6. String Reverse
7. Sum Of Series
8. Trigger

III. CURSOR

9. Student Mark Analysis Using Cursor

IV. APPLICATION

10. Library Management System
11. Student Mark Analysis

DATA MINING AND WAREHOUSING

Semester: V **Hours: 5**

Code : 23CS5DE1A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identifying the basic concepts of Data mining, Data Preprocessing, Mining Frequent Patterns, Associations, Correlations, Classification, Cluster Analysis and Outlier Detection	PSO-1	K1
CO - 2	Interpreting data Preprocessing, Mining Frequent Patterns, Associations, Correlations, Classification, Cluster Analysis and Outlier Detection	PSO-3	K2
CO - 3	Implement the appropriate algorithms for Data mining, Data Preprocessing, Mining Frequent Patterns, Associations, Correlations, Classification, Cluster Analysis and Outlier Detection	PSO-4	K3
CO - 4	Integrate the results of Data Preprocessing, Mining Frequent Patterns, Associations, Correlations, Classification, Cluster Analysis and Outlier Detection	PSO-2	K4
CO - 5	Compare the outcome Data Preprocessing, Mining Frequent Patterns, Associations, Correlations, Classification, Cluster Analysis and Outlier Detection.	PSO-5	K5

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

Semester: V				**DATA MINING AND WAREHOUSING**							**Hours: 5**
Code : 23CS5DE1A											**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	2	2	3	3	5	5	3	3	2	2	3.00
CO - 2	5	3	2	3	3	4	4	3	5	3	2	3.36
CO - 3	3	5	3	4	4	3	3	4	3	5	3	3.64
CO - 4	3	4	3	5	5	4	4	5	3	4	3	3.91
CO - 5	3	3	5	4	4	4	4	4	3	3	5	3.82
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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Introduction: Data mining - Data mining: an essential step in Knowledge discovery - Diversity of data types for data mining - Mining various kinds of knowledge - Data mining: confluence of multiple - disciplines - Data mining and applications - Data mining and society. **Data, measurements, and data preprocessing:** Data types - Statistics of data - Similarity and distance measures - Data quality, data cleaning, and data integration - Data transformation- Dimensionality reduction. **(15 Hours)**

UNIT II

Data warehousing and online analytical processing: Data warehouse - Data warehouse modeling: schema and measures - OLAP operations - Data cube computation - Data cube computation methods. **(15 Hours)**

UNIT III

Pattern mining: basic concepts and methods: Basic concepts - Frequent item set mining methods -Which patterns are interesting? Pattern evaluation methods. **Pattern mining: advanced methods:** Mining various kinds of patterns - Mining compressed or approximate patterns - Constraint-based pattern mining - Mining sequential patterns - Mining subgraph patterns - Pattern mining: application examples. **(15 Hours)**

UNIT IV

Classification: basic concepts and methods: Basic concepts - Decision tree induction - Bayes classification methods - Lazy learners (or learning from your neighbors) - Linear classifiers - Model evaluation and selection - Techniques to improve classification accuracy. **Classification: advanced methods:** Feature selection and engineering - Bayesian belief networks - Support vector machines - Rule-based and pattern-based classification - Classification with weak supervision - Classification with rich data type - Potpourri: other related techniques. **(15 Hours)**

UNIT V

Cluster analysis: basic concepts and methods: Cluster analysis - Partitioning methods - Hierarchical methods - Density-based and grid-based methods - Evaluation of clustering. **Cluster analysis: advanced methods**: Probabilistic model-based clustering - Clustering high - dimensional data - Bi-clustering - Dimensionality reduction for clustering - Clustering graph and network data - Semi-supervised clustering. **Outlier detection:** Basic concepts - Statistical approaches -Proximity-based approaches -Reconstruction-based approaches - Clustering- vs. classification-based approaches - Mining contextual and collective outliers - Outlier detection in high-dimensional data. **(15 Hours)**

COURSE BOOK

1. Jiawei Han, Jian Pei and Hanghang Tong, **"Data Mining Concepts and Techniques",** Morgan Kaufmann publications, Fourth Edition, 2023.

   UNIT I **:** Chapters: 1, 2

   UNIT II **:** Chapter: 3

   UNIT III **:** Chapters: 4, 5

   UNIT IV **:** Chapters: 6, 7

   UNIT V **:** Chapters: 8, 9, 11

BOOKS FOR REFERENCE

1. V. Ajay, K.P. Soman, Shyam Diwakar,**"Insight into Data Mining Theory and Practice",** Prentice Hall of India Pvt. Ltd, New Delhi.
2. Parteek Bhatia, **"Data Mining and Data Warehousing: Principles and Practical Techniques",** Cambridge University Press, 2019.

WEB RESOURSES

1. https://www.udemy.com/course/data-mining/
2. https://www.udemy.com/course/data-mining-fundamentals-for-beginners/
3. https://onlinecourses.swayam2.ac.in/cec23-cs12/preview
4. https://www.udemy.com/course/data-warehouse-the-ultimate-guide/
5. https://www.coursera.org/specializations/data-mining

INFORMATION SECURITY

Semester: V **Hours: 5**
Code : 23CS5DE1B **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 Security Problem, Elementary Cryptography, Security in Networks, Privacy in Computing, Public - Key Cryptography and RSA, Digital Signatures.	PSO-1	K1
CO - 2	Recognize the Security Problem, Elementary Cryptography, Security in Networks, Privacy in Computing, Public – Key Cryptography and RSA, Digital Signatures.	PSO-2	K2
CO - 3	Illustrate the Security Problem, Elementary Cryptography, Security in Networks, Privacy in Computing, Public - Key Cryptography and RSA, Digital Signatures.	PSO-3	K3
CO - 4	Point Out the Security Problem, Elementary Cryptography, Security in Networks, Privacy in Computing, Public - Key Cryptography and RSA, Digital Signatures.	PSO-5	K4
CO - 5	Compare and contrast the Security Problem, Elementary Cryptography, Security in Networks, Privacy in Computing, Public - Key Cryptography and RSA, Digital Signatures.	PSO-4	K5

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

Semester: V				**INFORMATION SECURITY**							**Hours: 5**
Code : 23CS5DE1B											**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	2	2	3	3	5	5	3	3	2	2	3.00
CO - 2	3	2	2	5	5	4	4	5	3	2	2	3.36
CO - 3	5	3	3	4	4	3	3	4	5	3	3	3.64
CO - 4	3	3	5	4	4	4	4	4	3	3	5	3.82
CO - 5	3	5	3	4	4	4	4	4	3	5	3	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

Security Problem in Computing: Attacks - The Meaning of Computer Security - Computer Criminals - Method of Defense. **Elementary Cryptography:** Substitution Ciphers Transpositions - Making Good Encryption Algorithm - The Data Encryption Standard - The AES Encryption Algorithm - Public Key Encryption. **(15 Hours)**

UNIT II

Program Security: Nonmalicious Program Errors - Viruses and Other Malicious Code - Targeted Malicious Code - Controls Against Program Threats. **Protection in General - Purpose Operating Systems:** Memory and Address Protection - Control of Access to General Objects - File Protection Mechanisms - User Authentication. **(15 Hours)**

UNIT III

Security in Networks: Network Concepts - Threats in Networks - Network SecurityControls - Firewalls - Intrusion Detection Systems - Secure E-Mail. **Administering Security:** Risk Analysis. **(15 Hours)**

UNIT IV

Privacy in Computing: Privacy Concepts - Privacy Principles and Policies - Authentication and Privacy - Data Mining - Privacy on the Web - E-Mail Security - Impactson Emerging Technologies. **(15 Hours)**

UNIT V

Public - Key Cryptography and RSA: Public Key Cryptosystem - The RSA Algorithm**. Digital Signature:** Digital Signatures - Elgamal Digital Signature Scheme - NIST Digital Signature Algorithm - Elliptic Curve Digital Signature Algorithm - RSA-PSS Digital Signature Algorithm. **(15 Hours)**

COURSE BOOK

1. Charles P. Pfleeger, **"Security in Computing"**, Pearson Education, Fourth Edition, 2006.

   UNIT I **:** Chapters: 1.2 - 1.5, 2.2 - 2.7

   UNIT II **:** Chapters: 3.2 - 3.5, 4.2 - 4.5

   UNIT III **:** Chapters: 7.1-7.6, 8.2

   UNIT IV **:** Chapter: 10

2. William Stallings, **"Cryptography and Network Security Principles and Practice",** Pearson, Sixth Edition, 2016.

   UNIT V **:** Chapters: 8, 12

BOOKS FOR REFERENCE

1. C. K. Shyamala, N. Harini, Dr. T. R Padmanabhan, **"Cryptography and Network Security",** Wiley India¸ First Edition, 2011.
2. Forouzan Mukhopadhyay, "**Cryptography and Network Security",** Mc Graw Hill, Seventh Edition.

WEB RESOURSES

1. https://archive.nptel.ac.in/courses/106/106/106106129/
2. https://onlinecourses.nptel.ac.in/noc23-cs127/preview
3. https://www.udemy.com/tutorial/iso-27001-cybersecurity-manager-guidelines/cybersecurity/

AGILE PROJECT MANAGEMENT

Semester: V **Hours: 5**
Code : 23CS5DE1C **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 Modernizing Project Management, Agile Manifesto and Principles, Agile Approaches, Actions, Product Vision and Roadmap, Managing Scope and Procurement, Being a Change Agent	PSO - 1	K1
CO - 2	Recognize the Modernizing Project Management, Agile Manifesto and Principles, Agile Approaches, Actions, Product Vision and Roadmap, Managing Scope and Procurement, Being a Change Agent.	PSO - 2	K2
CO - 3	Apply the Modernizing Project Management, Agile Manifesto and Principles, Agile Approaches, Actions, Product Vision and Roadmap, Managing Scope and Procurement, Being a Change Agent.	PSO - 3	K3
CO - 4	Classify the Modernizing Project Management, AgileManifesto and Principles, Agile Approaches, Actions, Product Vision and Roadmap, Managing Scope andProcurement, Being a Change Agent	PSO -4	K4
CO - 5	Assess the Modernizing Project Management, Agile Manifesto and Principles, Agile Approaches, Actions, Product Vision and Roadmap, Managing Scope and Procurement, Being a Change Agent.	PSO - 5	K5

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

Semester: V			**AGILE PROJECT MANAGEMENT**								**Hours: 5**
Code : 23CS5DE1C											**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	2	2	4	4	5	5	4	3	2	2	3.27
CO - 2	3	2	2	5	5	3	3	5	3	2	2	3.18
CO - 3	5	3	3	4	4	3	3	4	5	3	3	3.64
CO - 4	4	5	3	3	3	4	4	3	4	5	3	3.73
CO - 5	3	3	5	4	4	3	3	4	3	3	5	3.64
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Modernizing Project Management: 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 ofAgile Values - The Agile Litmus Test**.** **(15 Hours)**

UNIT II

Agile Approaches: Diving under the Umbrella of Agile Approaches - Reviewing the Big Three: Lean, Scrum, Extreme Programming. **Agile Environments in Action:** Creating the Physical Environment - Low-Tech Communicating - High-Tech Communicating - Choosing Tools. **Agile Behaviors in Action:** Establishing Agile Roles - Establishing New Values - Changing Team Philosophy. **(15 Hours)**

UNIT III

Defining the Product Vision and Product Roadmap: Agile Planning - Defining the Product Vision - Creating a Product Roadmap - Completing the Product Backlog**. Planning Releases and Sprints:** Refining Requirements and Estimates - Release Planning - Sprint Planning. **Preparing for Release:** Preparing the Product for Deployment: The Release Sprint - Preparing for Operational Support - Preparing the Organization for Product Deployment - Preparing the Marketplace for Product Deployment. **(15 Hours)**

UNIT IV

Managing Scope and Procurement: Different About Agile Scope Management - Managing Agile Scope - Different About Agile Procurement - Managing Agile Procurement**. Managing Time and Cost:** Different About Agile Time Management - Managing Agile Schedules -Different About Agile Cost Management - Managing Agile Budgets**. Managing Quality and Risk:** Different About Agile Quality - Managing Agile Quality -Different About Agile Risk Management - Managing Agile Risk. **(15 Hours)**

UNITV

Building a Foundation: Organizational and Individual Commitment - Choosing the Right Pilot Team Members - Creating an Environment that Enables Agility. **Being a Change Agent:** Becoming Agile Requires Change - Why Change Doesn‟t Happen on Its Own - Platinum Edge‟s Change Roadmap - Avoiding Pitfalls. **(15 Hours)**

COURSE BOOK

1. Mark C. Layton, Steven J. Ostermiller, ‘‘**Agile Project Management for Dummies”,** Wiley India Pvt. Ltd., Second Edition, 2018.

   UNIT I **:** Chapters: 1, 2

   UNIT II **:** Chapters: 4, 5, 6

   UNIT III **:** Chapters: 7, 8, 11

   UNIT IV **:** Chapters: 12, 13, 15

   UNIT V **:** Chapters: 16, 18

BOOKS FOR REFERENCE

1. Mark C. Layton, David Morrow, *S*, **“Scrum for Dummies”,** Wiley India Pvt. Ltd., Second Edition, 2018.
2. Mike Cohn, ‘‘**Software Development using Scrum”,** Succeeding with Agile -Addison-Wesley Signature Series, 2010.
3. Andrew Stellman and Jennifer Greene, ‘‘**Learning Agile: Understanding Scrum, XP, Lean, and Kanban, Shroff”,** O'Reilly’’, First Edition, 2014.

WEB RESOURCES

1. https://www.udemy.com/course/agile-project-management-genman/
2. https://www.udemy.com/course/scrum-course-udemy/
3. https://www.udemy.com/course/the-project-management-course-beginner-to-project- manager/
4. https://www.udemy.com/course/agile-fundamentals-scrum-kanban-scrumban/
5. https://www.udemy.com/course/agile-crash-course/

INTRODUCTION TO DATA SCIENCE

Semester: V **Hours: 5**
Code : 23CS5DE2A **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 significance and applications of datascience in various domains.	PSO - 1	K1
CO - 2	Define research goals and formulate data-driven research questions. Retrieve, preprocess, and transform data for effective analysis.	PSO - 3	K2
CO - 3	Identify various machine learning algorithms and their applications. Comprehend the modelling process, including model selection, training, and evaluation.	PSO - 2	K3
CO - 4	Gain an understanding of Hadoop and its ecosystem, including Spark. Recognize the role of NoSQL databases in handling big data.	PSO - 5	K4
CO - 5	Define research objectives and formulate data-centric research questions in the context of disease prediction. Retrieve, prepare, and explore healthcare data for meaningful analysis.	PSO - 4	K5

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

Semester: V			INTRODUCTION TO DATA SCIENCE								Hours: 5
Code : 23CS5DE2A											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	3	4	4	5	5	4	3	3	3	3.64
CO - 2	5	3	3	3	3	3	3	3	5	3	3	3.36
CO - 3	3	3	3	5	5	3	3	5	3	3	3	3.55
CO - 4	3	4	5	4	4	3	3	4	3	4	5	3.82
CO - 5	3	5	3	3	3	3	3	3	3	5	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

INTRODUCTION: Data Science: Benefits and uses - facets of data Data Science Process: Overview Defining research goals - Retrieving data - Data preparation - Exploratory Data analysis build the model presenting findings and building applications Data Mining-Data Warehousing - Basic Statistical descriptions of Data. **(15 Hours)**

UNIT II

DESCRIBING DATA: Types of Data - Types of Variables - Describing Data with Tables and Graphs-Describing Data with Averages - Describing Variability-Normal Distributions and Standard (z) Scores **(15 Hours)**

UNIT III

DESCRIBING RELATIONSHIPS: Correlation - Scatter plots-correlation coefficient for quantitative data -computational formula for correlation coefficient-Regression-regression line-least squares regression line - Standard error of estimate - interpretation of 12- multiple regression equations - regression towards the mean. **(15 Hours)**

UNIT IV

PYTHON LIBRARIES FOR DATA WRANGLING: Basics of Numpy arrays-aggregations-computations on arrays comparisons, masks, boolean logic-fancy indexing - structured arrays - Data manipulation with Pandas-data indexing and selection-operating on data-missing data - Hierarchical indexing-com- binding datasets - aggregation and grouping - pivot tables. **(15 Hours)**

UNIT V

DATA VISUALIZATION: Importing Matplotlib-Line plots-Scatter plots-visualizing errors-density and contour plots - Histograms-legends-colors-subplots-text and annotation - customization- three dimensional plotting-Geographic Data with Basemap-Visualization with Seaborn. **(15 Hours)**

COURSE BOOK

1. Dr. Devi. P.P, Dr. D. Vanathi, Dr. R. Joshitta, Dr. Jenifer Jothi Mary, **"Foundations of Data Science",** A, Charulatha Publications, 2023

UNIT I	**:**	Chapter	: 1
UNIT II	**:**	Chapter	: 2
UNIT III	**:**	Chapter	: 3
UNIT IV	**:**	Chapter	: 4
UNIT V	**:**	Chapter	: 5

BOOKS FOR REFERNCE

1. Davy Cielen, Arno D. B. Meysman, Mohamed Ali, **"Introducing Data Science",** Manning Publications, 2016.
2. Murtaza Haider, **"Getting Started with Data Science - Making Sense of Data with Analytics**", IBM press, E-book.

WEB RESOURCES

1. https://www.w3schools.com/datascience/ds-introduction.asp
2. https://www.heavy.ai/learn/data-science
3. http://rafalab.dfci.harvard.edu/dsbook/
4. https://www.simplilearn.com/tutorials/data-science-tutorial/introduction-to-data-science

ROBOTICS AND ITS APPLICATIONS

Semester: V **Hours: 5**
Code : 23CS5DE2B **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, Kinematics of Serial Robots, Trajectory Planning, Motion Control Systems, Actuators and Drive Systems, Image Processing and Analysis.	PSO - 1	K1
CO - 2	Understand Kinematics of Serial Robots, Trajectory Planning, Motion Control Systems, Actuators and Drive Systems, Image Processing and Analysis.	PSO -2	K2
CO - 3	Apply Kinematics of Serial Robots, Trajectory Planning, Motion Control Systems, Actuators and Drive Systems,Image Processing and Analysis.	PSO - 3	K3
CO - 4	Analyze Kinematics of Serial Robots, Trajectory Planning, Motion Control Systems, Actuators and Drive Systems, Image Processing and Analysis.	PSO - 4	K4
CO - 5	Evaluate Kinematics of Serial Robots, Trajectory Planning, Motion Control Systems, Actuators and Drive Systems,Image Processing and Analysis.	PSO - 5	K5

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

Semester: V							**ROBOTICS AND ITS APPLICATIONS**					**Hours: 5**
Code : 23CS5DE2B												**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	2	2	3	3	5	5	3	3	2	2	3.00
CO - 2	3	3	2	5	5	3	3	5	3	3	2	3.36
CO - 3	5	3	3	3	3	3	3	3	5	3	3	3.36
CO - 4	4	5	3	3	3	4	4	3	4	5	3	3.73
CO - 5	3	3	5	4	4	3	3	4	3	3	5	3.64
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Fundamentals 1: Introduction- A robot - Classification of Robots -What Is Robotics? - History of Robotics-Advantages and Disadvantages of Robots-Robot Components-Robot Characteristics-Robot Workspace-Robot Languages- Robot Applications- Social Issues. **(15 Hours)**

UNIT II

Kinematics of Serial Robots: Position Analysis: Introduction- Robots as Mechanisms- Conventions- Matrix Representation- Representation of Transformations -Homogeneous Transformation Matrices- Forward and Inverse Kinematic Equations: Position- Design Projects. **(15 Hours)**

UNIT III

Trajectory Planning: Introduction -Path vs. Trajectory - Joint-Space vs. Cartesian-Space -Descriptions -Basics of Trajectory Planning - Joint-Space Trajectory Planning- Cartesian- Space Trajectories -Continuous Trajectory Recording - Design Project. **Motion Control Systems**: Introduction -Basic Components and Terminology-Block Diagrams - System Dynamics - Laplace Transform -Inverse Laplace Transform- Transfer Functions - Block Diagram Algebra. **(15 Hours)**

UNIT IV

Actuators and Drive Systems - Introduction -Characteristics of Actuating Systems. Comparison of Actuating Systems - Hydraulic Actuators - Pneumatic Devices. **Sensors** - Introduction - Sensor Characteristics -Sensor Utilization - Position Sensors- Velocity Sensors- Acceleration Sensors -Force and Pressure Sensors. **(15 Hours)**

UNIT V

Image Processing and Analysis with Vision Systems: Introduction -Basic Concepts- Object Recognition by Features - Depth Measurement with Vision Systems-Image Data Compression. **(15 Hours)**

COURSE BOOK

1. Saeed B. Nikku, "**Introduction to robotics, analysis, control and applications",** Wiley-India, Second Edition, 2011.

UNIT I : Chapter: 1(1.1-1.7, 1.13-1.16, 1.19)

UNIT II : Chapter: 2 (2.1-2.5, 2.9, 2.18)

UNIT III : Chapters:7, 8 (8.1-8.88)

UNIT IV : Chapters: 9 (9.1-9.5), 10 (10.1-10.7)

UNIT V : Chapters: 11 (11.1, 1.2, 11.21-11.22, 11.24)

BOOKS FOR REFERENCE

1. "**Industrial robotic technology-programming and application**" M.P. Groover et.al,McGraw Hill 2008
2. **"Robotics technology and flexible automation",** S .R. Deb, THH-2009

WEB RESOURCES

1. https://www.udemy.com/course/robotic-drives-and-physics/
2. https://www.udemy.com/course/ros2-robotics-developer-course-using-ros2-in-python/
3. https://www.udemy.com/course/robotics-mechatronics-1-machine-design-theory/
4. https://www.udemy.com/course/arduino-robotics-building-and-programming-robots/

HUMAN COMPUTER INTERACTION

Semester: V **Hours: 5**
Code : 23CS5DE2C **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 concepts of Foundations Of HCI, Paradigms, Evaluation Techniques, Universal Design, Hyper Text, Multi Media, Web Interface Design.	PSO - 1	K1
CO - 2	Understand the concepts of Foundations Of HCI, Paradigms, Evaluation Techniques, Universal Design, Hyper Text, Multi Media, Web Interface Design.	PSO - 3	K2
CO - 3	Apply the concepts of Foundations Of HCI, Paradigms, Evaluation Techniques, Universal Design, Hyper Text, Multi Media, Web Interface Design.	PSO - 2	K3
CO - 4	Analyze the concepts of Foundations Of HCI, Paradigms, Evaluation Techniques, Universal Design, Hyper Text, Multi Media, Web Interface Design.	PSO - 4	K4
CO - 5	Evaluate the concepts of Foundations Of HCI, Paradigms, Evaluation Techniques, Universal Design, Hyper Text, Multi Media, Web Interface Design.	PSO - 5	K5

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

Semester: V							**HUMAN COMPUTER INTERACTION**					**Hours: 5**
Code : 23CS5DE2C												**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	3	3	3	5	5	3	3	3	3	3.36
CO - 2	5	3	4	4	4	3	3	4	5	3	4	3.82
CO - 3	3	3	3	5	5	3	3	5	3	3	3	3.55
CO - 4	4	5	3	3	3	3	3	3	4	5	3	3.55
CO - 5	3	3	5	4	4	3	3	4	3	3	5	3.64
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

FOUNDATIONS: The Human: Input-output channels - Human Memory. Thinking: reasoning and problem solving. **The Computer:** Text entry devices - Memory - Processing and Networks. **The Interaction:** Models of interaction- Frameworks and HCI- Ergonomics - Interaction styles - Elements of the WIMP interface - Interactivity. **Paradigms:** Paradigm for interaction. **(15 Hours)**

UNIT II

DESIGN PROCESS: Interaction design basics -design - Scenarios - Navigation design - Screen design and layout - Iteration and Prototyping. **HCI in software process:** Software Life cycle - Usability Engineering - Iterative Design and Prototyping - Design rationale. **Design rules**: Principles - Standards - Guidelines - Golden Rules and Heuristics. **Evaluation Techniques** - **Universal Design**. **(15 Hours)**

UNIT III

MODELS AND THEORIES: Cognitive Models: Goal and task Hierarchies - Linguistic Models - The Challenge of Display Based Systems - Physical and Device Models - Cognitive Architectures - **Socio-Organizational issues and stakeholder requirements :** Organizational Issues - Capturing Requirements - **Communication and collaboration models:** Face-to-Face Communication - Conversation - Text Based Communications - Group Working - **Hypertext, Multimedia and WWW:** Understanding Hypertext - FindingThings - Web Technology and Issues - Static Web Content - Dynamic Web Content. **(15 Hours)**

UNIT IV

Mobile HCI: Mobile Ecosystem: Operators - Networks - Devices - Platforms - Application Framework - **Types of Mobile Applications:** Mobile Application Medium Types - **Mobile Information Architecture**: Information Architecture - Mobile Information Architecture. **Mobile Design:** Elements of Mobile Design - Tools. **Mobile 2.0**. **(15 Hours)**

UNIT V

Designing Web Interfaces: Drag & Drop - Direct Selection - Contextual Tools - Overlays - Inlays - Virtual Pages - Process Flow: Case Studies.

(15 Hours)

COURSE BOOK

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, **"Human -Computer Interaction",** Pearson Education, Third Edition, 2004.

   UNIT I **:** Chapter: 1.1-1.7, 1.13-1.16, 1.19

   UNIT II **:** Chapter: 2.1-2.5, 2.9, 2.18

   UNIT III **:** Chapters: 7, 8.1-8.8

2. Brian Fling, **"Mobile Design and Development",** O. Reilly Media Inc., First Edition, 2009.

   UNIT IV **:** Chapters: 9.1-9.5, 10.1-10.7

3. Bill Scott and Theresa Neil, **"Designing Web Interfaces",** O. Reilly, First Edition, 2009.

   UNIT V **:** Chapter: 11 (11.1, 1.2, 11.21-11.22, 11.24)

BOOKS FOR REFERENCE

1. M. P. Groover et.al, "**Industrial Robotic Technology-Programming and Application**", McGraw Hill, 2008
2. S. R. Deb, **"Robotics technology and flexible automation",** THH, 2009.

WEB RESOURCES

1. https://www.udemy.com/course/robotic-drives-and-physics/
2. https://www.udemy.com/course/ros2-robotics-developer-course-using-ros2-in-python/
3. https://www.udemy.com/course/robotics-mechatronics-1-machine-design-theory/
4. https://www.udemy.com/course/arduino-robotics-building-and-programming-robots/

INTERNSHIP CUM MINI PROJECT

Semester: V

Code : 23CS5IN01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Learn the fundamentals of an internship site/ industrial set up.	PSO-1	K1
CO - 2	Explain the acquired knowledge and demonstrate.	PSO-2	K2
CO - 3	Apply the principles involved in machineries and tools to the current scenario.	PSO-3	K3
CO - 4	Develop their soft skills for their working environment in the near future.	PSO-4	K4
CO - 5	Emerge as an Entrepreneurs	PSO-5	K5

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

Semester: V				**INTERNSHIP CUM MINI PROJECT**								
Code : 23CS5IN01												**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	3	4	4	5	5	4	3	3	3	3.64
CO - 2	4	3	3	5	5	3	3	5	4	3	3	3.73
CO - 3	5	3	3	3	3	4	4	3	5	3	3	3.55
CO - 4	4	5	3	3	3	3	3	3	4	5	3	3.55
CO - 5	3	3	5	3	3	3	3	3	3	3	5	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	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 INTERNSHIP CUM MINI PROJECT - GUIDELINES

I. The Internship cum Mini Project in the B.Sc. Computer Science program is offered as an extra-credit opportunity, undertaken during the summer vacation at the end of the fourth semester.

II. Students earn 2 additional credits by successfully completing this internship and submitting a report, although these credits are marked as "pass" and do not contribute to the overall grade point average (OPM).

III. The evaluation structure for this component is distinct: unlike regular papers that follow a split between internal and external assessments, the Internship cum Mini Project is assessed entirely internally and carries a total of 100 marks.

IV. The internal assessment consists of several components designed to monitor both process and deliverables. Two review sessions, each evaluated for 25 marks, collectively amount to 50 marks and assess the planning and execution phases of the project. Additionally, execution and output of the mini project are assessed for 30 marks, the student's record or logbook is valued at 10 marks, attendance is allocated 5 marks, and the presentation of the work accounts for 20 marks, bringing the total to 100 marks

V. This project provides students a platform to apply theoretical knowledge to practical, real-world contexts, helping to develop their documentation skills, presentation capabilities, and professional readiness.

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

SOFTWARE ENGINEERING

Semester: VI **Hours: 5**

Code : 23CS6MC11 **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 basic knowledge of software Analysis and Specification, Software Design, UID, Coding and Testingand Maintenance.	PSO-1	K1
CO - 2	Recollect the SLC Models, Analysis and Specification, Software Design, User Interface Design, Coding and Testing and Maintenance.	PSO-2	K2
CO - 3	Apply the Software Life Cycle Models, Requirements Analysis and Specification, Software Design, User Interface Design, Coding and Testing, CASE, Software Maintenance.	PSO-3	K3
CO - 4	Compare and Analysis, Software Design, User Interface Design, Coding and Testing, CASE, Software Maintenance.	PSO-5	K4
CO - 5	Perform Testing at various levels and produce an efficient system	PSO-4	K5

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

Semester: VI				SOFTWARE ENGINEERING								Hours: 5
Code : 23CS6MC11												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	2	4	3	3	5	5	3	3	2	4	3.36
CO - 2	4	2	3	5	5	3	3	5	4	2	3	3.55
CO - 3	5	3	3	3	3	3	3	3	5	3	3	3.36
CO - 4	2	4	5	4	4	3	3	4	2	4	5	3.64
CO - 5	4	5	3	3	3	3	3	3	4	5	3	3.55
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

Introduction: Evolution-From an Art Form to an Engineering Discipline - SoftwareDevelopment Projects - Exploratory Style of Software Development - Emergence of Software Engineering - Notable Changes in Software Development Practices - Computer Systems Engineering. **Software Life Cycle Models:** A Few Basic Concepts - Waterfall Model and Its Extensions - Rapid Application Development - Spiral Model - Comparison of Different Life Cycle Models. **(15 Hours)**

UNIT II

Requirements Analysis and Specification: Requirements Gathering and Analysis - Software Requirements Specification (SRS). **Software Design:** Overview of the Design Process -Characterize a Good Software Design - Cohesion and Coupling - Layered Arrangement of Modules - Approaches to Software Design. **(15 Hours)**

UNIT III

Function-Oriented Software Design: Overview of SA/SD Methodology - Structured Analysis - - Development of the DFD Model of a System - Structured Design - Detailed Design - Design Review. **User Interface Design:** Characteristics of a Good User Interface - Basic Concepts - Types of User Interfaces - Fundamentals of Component-based GUI Development - A User Interface Design Methodology. **(15 Hours)**

UNIT IV

Coding and Testing: Coding - Code Review - Software Documentation - 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 - ISO 9000 - SEI Capability Maturity Model. **(15 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:** Characteristics of Software Maintenance - Software Reverse Engineering - Software Maintenance Process Models-Estimation of Maintenance Cost. **(15 Hours)**

COURSE BOOK

1. Rajib Mall, **"Fundamentals of Software Engineering",** PHI Learning Private Limited,Fifth Edition, 2018.

   UNIT I **:** Chapters: 1, 2

   UNIT II **:** Chapters: 4.1, 4.2, 5

   UNIT III **:** Chapters: 6, 9

   UNIT IV **:** Chapters: 10, 11.1-11.6

   UNIT V **:** Chapters: 12, 13

BOOKS FOR REFERENCE

1. Richard Fairley, **"Software Engineering Concepts",** Tata McGraw-Hill publishing company Ltd, Edition 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://onlinecourses.nptel.ac.in/noc20-cs68/preview
2. https://archive.nptel.ac.in/courses/106/105/106105182/
3. https://www.udemy.com/courses/development/software-engineering/

COMPUTER GRAPHICS

Semester: VI **Hours: 5**

Code : 23CS6MC12 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe Standard raster and vector scan devices aswell as Graphical Input and output devices	PSO-1	K1
CO - 2	Implement algorithms for drawing basic primitivessuch as line circle and ellipse.	PSO-2	K2
CO - 3	Implement algorithms for line clipping and polygon clipping and filling, Two-Dimensional Geometric Transformations.	PSO- 3	K3
CO - 4	Implement a 3D object representation scheme and carryout 2D and 3D Transformation, 3D projections	PSO-5	K4
CO - 5	Implement visible surface determination algorithms, Illumination models and surface rendering methods, color models.	PSO- 4	K5

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

Semester: VI				COMPUTER GRAPHICS							Hours: 5
Code : 23CS6MC12											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	2	4	4	5	5	4	3	3	2	3.45
CO - 2	3	3	2	5	5	3	3	5	3	3	2	3.36
CO - 3	5	4	4	3	3	3	3	3	5	4	4	3.73
CO - 4	3	3	5	3	3	4	4	3	3	3	5	3.55
CO - 5	2	5	3	3	3	3	3	3	2	5	3	3.18
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 = 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. **(15 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. **(15 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. **(15 Hours)**

UNIT IV

Two-Dimensional Viewing: The Viewing Pipeline - Viewing Coordinate Reference Frame - Window-to-ViewPort Coordinate Transformation - Two-Dimensional Viewing Functions - Clipping Operations - Point Clipping - Line Clipping - Polygon Clipping - Curve Clipping - Text Clipping - Exterior Clipping. **Structures and Hierarchical Modeling:** Structure Concepts - Editing Structures - Basic Modeling Concepts - Hierarchical Modeling with Structures. **(15 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. **(15 Hours)**

COURSE BOOK

1. 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, 5

   UNIT IV : Chapters : 6, 7

   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.

WEB RESOURCES

1. https://onlinecourses.nptel.ac.in/noc20-cs90/preview
2. https://www.udemy.com/course/computer-graphics-subject/
3. https://www.coursera.org/learn/interactive-computer-graphics

OPERATING SYSTEM

Semester: VI **Hours: 5**

Code : 23CS6MC13 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the History of OS, Process, Thread, Deadlock, Processor Scheduling, Virtual Memory,File and Database Systems.	PSO - 1	K1
CO - 2	Demonstrate the concepts of Process, Thread, Deadlock, Processor Scheduling, Virtual Memory,File and Database Systems.	PSO - 2	K2
CO - 3	Interpret the concepts of Process, Thread, Deadlock, Processor Scheduling, Virtual Memory, File and Database Systems.	PSO - 4	K3
CO - 4	Categorize the concepts of Process, Thread, Deadlock, Processor Scheduling, Virtual Memory, File and Database Systems.	PSO - 3	K4
CO - 5	Assess the concepts of Process, Thread, Deadlock, Processor Scheduling, Virtual Memory, File and Database Systems.	PSO -5	K5

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

Semester: VI											**Hours: 5**
Code : 23CS6MC13											**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	2	3	4	3	3	5	5	3	2	3	4	3.27
CO - 2	3	4	3	5	5	3	3	5	3	4	3	3.73
CO - 3	3	5	3	4	4	3	3	4	3	5	3	3.64
CO - 4	5	3	3	4	4	3	3	4	5	3	3	3.64
CO - 5	3	3	5	3	3	4	4	3	3	3	5	3.55
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: Operating System - Early History, The 1940s to 1950s. **Process Concepts:** Introduction - Process States: Life Cycle of a Process - Process Management - Interrupts - Inter Process Communication. **(15 Hours)**

UNIT II

Thread Concepts: Definition of Thread - Motivation for Threads - Thread State: Life Cycle of a Thread - Thread Operations - Thread Models - Thread Implementations and Considerations - POSIX and Pthreads - Linux Threads. **Asynchronous Concurrent Execution:** Mutual Exclusion- Implementing Mutual Exclusion Primitives - Software Solutions to the Mutual Exclusion Problem -Hardware Solutions to the Mutual Exclusion Problem - Semaphores. **(15 Hours)**

UNIT III

Concurrent Programming: Monitors. **Deadlock and Indefinite Postponement:** Resource Concepts - Four Necessary Conditions for Deadlock - Deadlock Solutions - DeadlockPrevention - Deadlock Avoidance with Dijkstra's Banker's algorithm - Deadlock Detection - Deadlock Recovery. **(15 Hours)**

UNIT IV

Processor Scheduling: Scheduling Levels - Scheduling Objectives - Scheduling Criteria - Scheduling Algorithms - Deadlock Scheduling - Real-time Scheduling. **Real Memory Organization and Management:** Memory Organization -Memory Management - Memory Hierarchy - Memory Management Strategies - Contiguous vs. Noncontiguous Memory Allocation - Single-User Contiguous Memory Allocation - Fixed-Partition Multi programming - Variable-Partition Multiprogramming - Multiprogramming with Memory Swapping. **(15 Hours)**

UNIT V

Virtual Memory Organization: Virtual Memory: Basic Concepts - Block Mapping - Paging - Segmentation - Segmentation/Paging Systems. **Virtual Memory Management:** Demand Paging -Anticipatory Paging - Page Replacement - Page Replacement Strategies. **File and Database Systems:** Files - File Systems - File Organization - File Allocation - Free Space Management - File Access Control -Data Access Techniques - Data Integrity Protection. **(15 Hours)**

COURSE BOOK

1. Harvey M. Deitel, **"Operating System",** Pearson Education, Third Edition, 2011.

UNIT I	**:** Chapters	:	1.2, 1.3, 3.1 - 3.5
UNIT II	**:** Chapters	:	4.2 - 4.9, 5
UNIT III	**:** Chapters	:	6.2, 7.2 - 7.10
UNIT IV	**:** Chapters	:	8.2 - 8.9, 9.2 - 9.10
UNIT V	**:** Chapters	:	10.2 -10.6, 11.3 - 11.6, 13.3 -13.10

BOOKS FOR REFERENCE

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

WEB RESOURCES

1. https://nptel.ac.in/courses/106105214
2. https://www.coursera.org/specializations/codio-introduction-operating-systems
3. https://www.udemy.com/course/operating-system-j/

PROJECT WITH VIVA - VOCE

Semester: VI **Hours: 8**

Code : 23CS6PR01 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify a problem in their respective field.	PSO-1	K1
CO - 2	Understand the various steps involved in solving the problem.	PSO-2	K2
CO - 3	Apply various skills to solve the problem.	PSO-3	K3
CO - 4	Interpret their findings in the respective field.	PSO-4	K4
CO - 5	Present the outcome of their project.	PSO-5	K5

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

Semester: VI				PROJECT WITH VIVA - VOCE							Hours: 8
Code : 23CS6PR01											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	2	3	4	4	5	5	4	3	2	3	3.45
CO - 2	3	2	3	5	5	3	3	5	3	2	3	3.36
CO - 3	5	2	4	3	3	3	3	3	5	2	4	3.36
CO - 4	3	5	3	4	4	4	4	4	3	5	3	3.82
CO - 5	3	3	5	3	3	2	2	3	3	3	5	3.18
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UG PROJECT WITH VIVA-VOCE - GUIDELINES

I. B.Sc. Computer Science curriculum is designed as a culminating and integrative learning experience, carried out during the sixth semester.

II. The project spans a substantial 8 hours per week throughout the semester and carries 4 credits, underscoring its importance in the academic programme.

III. The primary learning outcomes focus on students acquiring practical knowledge in their chosen technological area, applying computing and information technologies effectively to design tailored solutions, as well as developing a comprehensive and systematic approach.

IV. The evaluation typically emphasizes both technical competence and presentation skills, thereby ensuring that students not only deliver functional and well-designed projects, but also communicate their work effectively.

V. The project report must be well-structured and systematically documented. It should begin with a cover page containing the title and student details, followed by a certificate from the guide and the Head of the Department, an acknowledgement, and an abstract that summarizes the work in a concise manner.

IMAGE PROCESSING

Semester: VI **Hours: 4**
Code : 23CS6DE3A **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 Digital Image Fundamentals, Filtering in the Frequency Domain, Image Restoration and Reconstruction, Color Image Processing. Image Segmentation	PSO - 1	K1
CO - 2	Understand the Digital Image Fundamentals, Filtering in the Frequency Domain, Image Restoration and Reconstruction, Color Image Processing. Image Segmentation	PSO - 2	K2
CO - 3	Apply the Digital Image Fundamentals, Filtering in the Frequency Domain, Image Restoration and Reconstruction, Color Image Processing. Image Segmentation	PSO - 3	K3
CO - 4	Analyze the Digital Image Fundamentals, Filtering in the Frequency Domain, Image Restoration and Reconstruction, Color Image Processing. Image Segmentation	PSO -4	K4
CO - 5	Evaluate the Digital Image Fundamentals, Filtering in the Frequency Domain, Image Restoration and Reconstruction, Color Image Processing. Image Segmentation	PSO - 5	K5

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

Semester: VI				**IMAGE PROCESSING**							**Hours: 4**
Code : 23CS6DE3A											**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	3	3	3	5	5	3	3	2	3	3.18
CO - 2	3	4	3	5	5	3	3	5	3	4	3	3.73
CO - 3	5	3	4	3	3	4	4	3	5	3	4	3.73
CO - 4	3	5	3	3	3	3	3	3	3	5	3	3.36
CO - 5	3	3	5	3	3	4	4	3	3	3	5	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Digital Image Fundamentals: Elements of Visual Perception - Light and the Electromagnetic Spectrum-Image Sensing and Acquisition - Image Sampling and Quantization - Some Basic Relationships Between Pixels-Introduction to the Basic Mathematical Tools Used in Digital Image Processing**. Intensity Transformations and Spatial Filtering:** Background- Some Basic Intensity Transformation Functions - Histogram Processing- Fundamentals of Spatial Filtering- Smoothing (Low Pass) Spatial Filters- Sharpening (High Pass) Spatial Filters. **(12 Hours)**

UNIT II

Filtering in the Frequency Domain: Background - Preliminary Concepts - Sampling and the Fourier Transform of Sampled Functions - The Discrete Fourier Transform of One Variable - Extension to Functions of Two Variables.

(12 Hours)

UNIT III

Image Restoration and Reconstruction: Noise Models- Restoration in the Presence of Noise Only-Spatial Filtering- Periodic Noise Reduction Using Frequency Domain Filtering- Linear, Position-Invariant Degradations- Estimating the Degradation Function- Inverse Filtering -Minimum Mean Square Error (Wiener) Filtering - Constrained Least Squares Filtering - Geometric Mean Filter-Image Reconstruction from Projections**. (12 Hours)**

UNIT IV

Color Image Processing: Color Fundamentals-Color Models - Pseudocolor Image Processing- Basics of Full-Color Image Processing- Color Transformations- Color Image Smoothing and Sharpening- Using Color in Image Segmentation -Noise in Color Images - Color Image Compression. **Image Compression and Watermarking:** Fundamentals- Huffman Coding-Golomb Coding-Arithmetic Coding-Wavelet Coding - Digital Image Watermarking. **(12 Hours)**

UNIT V

Image Segmentation: Fundamentals- Point, Line, and Edge Detection- Thresholding - Merging-Region Segmentation Using Clustering and Super pixels- Segmentation Using Morphological Watersheds- The Use of Motion in Segmentation**. Image Pattern Classification:** Background -Patterns and Pattern Classes - Neural Networks and DeepLearning. **(12 Hours)**

COURSE BOOK

1. Rafael C. Gonzalez, Richard E. Woods, **"Digital Image Processing",** Pearson, Fourth Edition, 2018.

   UNIT I : Chapters : 2, 3

   UNIT II : Chapter : 4

   UNIT III : Chapter : 5

   UNIT IV : Chapters : 6, 8

   UNIT V : Chapters : 10, 12

BOOKS FOR REFERENCE

1. V. Chandra Shekhar Rao, Sunkari Venkatramulu Dr. P. Sammulal, **"Digital Image Processing and Applications",** Horizon Books, First Edition, 2021.
2. Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins, **"Digital Image Processing Using MATLAB",** Tata Mc Graw Hill Pvt. Ltd., Third Edition, 2011.
3. Anil Jain K, **"Fundamentals of Digital Image Processing",** PHI Learning Pvt. Ltd.,2011.

WEB RESOURCES

1. https://www.udemy.com/course/matlabipt/
2. https://www.udemy.com/course/python-3-image-processing-masterclass/
3. https://www.udemy.com/course/image-processing-from-ground-uptm-in-c/
4. https://www.udemy.com/course/imageprocessingopencv/
5. https://www.udemy.com/course/image-data-processing-with-python/

CYBER FORENSICS

Semester: VI **Hours: 4**

Code : 23CS6DE3B **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 Computer Forensics Fundamentals, Types, Evidence, Data Seizure, Discovery ofElectronic Evidence, Networks.	PSO - 1	K1
CO - 2	Understand Computer Forensics, Types, Evidence, Data Seizure, Discovery of Electronic Evidence, Networks.	PSO - 3	K2
CO - 3	Apply Computer Forensics, Types, Evidence, Data Seizure, Discovery of Electronic Evidence, Networks.	PSO - 2	K3
CO - 4	Analyze Computer Forensics, Types, Evidence, Data Seizure, Discovery of Electronic Evidence, Networks.	PSO - 4	K4
CO - 5	Evaluate Computer Forensics, Types, Evidence, DataSeizure, Discovery of Electronic Evidence, Networks.	PSO - 5	K5

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

Semester: VI				CYBER FORENSICS							Hours: 4
Code : 23CS6DE3B											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	3	3	3	5	5	3	3	3	3	3.36
CO - 2	5	4	3	3	3	3	3	3	5	4	3	3.55
CO - 3	3	3	3	5	5	3	3	5	3	3	3	3.55
CO - 4	3	5	3	3	3	3	3	3	3	5	3	3.36
CO - 5	3	4	5	3	3	4	4	3	3	4	5	3.73
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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Computer Forensics Fundamentals: Introduction to Computer Forensics - Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings - Computer Forensics Services - Benefits of professional Forensics Methodology - Steps taken by Computer Forensics Specialists - **Types of Computer Forensics Technology:** Types of Military Computer Forensic Technology-Types of Law Enforcement-Computer Forensic Technology-Types of Business Computer Forensic Technology. **(12 Hours)**

UNIT II

Computer Forensics Evidence and capture: Data Recovery: Data Recovery Defined - Data Backup and Recovery - The Role of Back -up in Data Recovery - The Data -Recovery Solution - **Evidence Collection and Data Seizure:** Collect Evidence - Collection Options - Obstacles - Types of Evidence - The Rules of Evidence - Volatile Evidence - General Procedure - Collection and Archiving - Methods of Collections - Artefacts - Collection Steps - Controlling Contamination: The chain of custody. **(12 Hours)**

UNIT III

Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene - Compute Evidence Processing steps - Legal Aspects of collecting and Preserving Computer forensic Evidence. **Computer Image Verification and Authentication:** Special needs of Evidential Authentication - Practical Consideration - Practical Implementation.

(12 Hours)

UNIT IV

Discovery of Electronic Evidence: Electronic Document Discovery: A Powerful New Litigation Tool - **Identification of Data:** Timekeeping - Forensic Identification and Analysisof Technical Surveillance Devices.

(12 Hours)

UNIT V

Reconstructing Past Events: How to Become a Digital Detective - Useable File Formats -Unusable File Formats - Converting Files -**Networks:** Network Forensics Scenario - a technical approach - Destruction Of E-Mail - Damaging Computer Evidence - Tools needed for Intrusion on Destruction of Data - System Testing. **(12 Hours)**

COURSE BOOK

1. John R. Vacca, **"Computer Forensics: Computer Crime Investigation",** Firewall Media, Third Edition, New Delhi, 2015.

   UNIT I: Chapters 1.1 - 1.6, 2.1 - 2.3

   UNIT II: Chapter 5.1 - 5.4, 6.1 - 6.12

   UNIT III: Chapters: 7, 8

   UNIT IV: Chapters: 9, 10

   UNIT V: Chapters 11, 12

BOOKS FOR REFERENCE

1. Nelson, Phillips Enfinger, Steuart, Enfinger, Steuart, **"Computer Forensics and Investigations",** CENGAGE Learning, 2004.
2. Anthony Sammes and Brian Jenkinson, **"Forensic Computing: A Practitioner's Guide",** Springer-Verlag London Limited, Second Edition, 2007.
3. Robert M. Slade, **"Software Forensics Collecting Evidence from the Scene of a Digital Crime",** TMH 2005**.**

WEB RESOURCES

1. https://onlinecourses.swayam2.ac.in/cec24-ge04/preview
2. https://www.udemy.com/course/cyber-forensics-for-beginners/
3. https://www.udemy.com/course/computer-hacking-forensic-investigator-chfi- essentials-unofficial/
4. https://www.udemy.com/course/digital-forensics-for-pentesters-hands-on-learning/

ARTIFICIAL INTELLIGENCE

Semester: VI **Hours: 4**

Code : 23CS6DE3C **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 Foundations, Problem Solving Methods in AI, Informed and Uninformed Search Strategies, Expert Systems and Applications, Prolog, Modern AI Languages and Tools.	PSO - 1	K1
CO - 2	Understand Problem Solving Methods in AI, Informed and Uninformed Search Strategies, Expert Systemsand Applications, Prolog, Modern AI Languages and Tools.	PSO - 4	K2
CO - 3	Apply Problem Solving Methods in AI, Informed and Uninformed Search Strategies, Expert Systems and Applications, Prolog, Modern AI Languages and Tools.	PSO - 3	K3
CO - 4	Analyze Problem Solving Methods in AI, Informed and Uninformed Search Strategies, Expert Systems and Applications, Prolog, Modern AI Languages and Tools.	PSO - 2	K4
CO - 5	Evaluate Problem Solving Methods in AI, Informed and Uninformed Search Strategies, Expert Systems and Applications, Prolog, Modern AI Languages and Tools.	PSO - 5	K5

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

Semester: VI				ARTIFICIAL INTELLIGENCE								Hours: 4
Code : 23CS6DE3C												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	3	3	3	5	5	3	3	2	3	3.18
CO - 2	3	5	3	3	3	4	4	3	3	5	3	3.55
CO - 3	5	3	3	3	3	3	3	3	5	3	3	3.36
CO - 4	4	3	3	5	5	3	3	5	4	3	3	3.73
CO - 5	3	3	5	3	3	4	4	3	3	3	5	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Foundations of Artificial Intelligence: History of Artificial Intelligence - Artificial Intelligence-Problems and Techniques- Production System Criteria. **Problem Solving Methods in Artificial Intelligence:** State Space Search -Production Systems -ProblemCharacteristics -Issues in the designs of Search. **(12 Hours)**

UNIT II

Informed and Uninformed Search Strategies: Generate-and-Test Method - Hill Climbing Method -Best First Search and A* Search - Means End Analysis - Problem Reduction, AO* Algorithm - Constraint Satisfaction with Inference, Backtracking, and Local Search. **(12 Hours)**

UNIT III

Knowledge Representation: Ontologies, Object, and Events - Representations andMappings-Approaches to Knowledge Representations-Slot and Filler Structure - Issuesin Knowledge Representations - Forward Vs Backward Chaining - Matching - Control Knowledge. **(12 Hours)**

UNIT IV

Expert Systems and Applications: Expert System - Knowledge Representation - Expert System Shells - Knowledge Acquisition of an Expert System - Application of Expert System - Example of Expert Systems - Problem Solving Example. **Logic in Artificial Intelligence**: Introduction - Propositional Logic - First-Order Logic. **(12 Hours)**

UNIT V

Prolog: Logic Programming: Symbolic Logic, Clausal Form - Prolog Terminology -Variable and Arithmetic Operators - Inference Process of Prolog - List Structure - Operations on List. **Modern Artificial Intelligence Languages and Tools:** Python - MATLAB - R. **(12 Hours)**

COURSE BOOK

1. Lavika Goel, **"Artificial Intelligence Concept and Applications",** WilleyEmerging Technology Series, First Edition. 2021.

UNIT I : Chapters: 1, 2

UNIT II : Chapter: 3

UNIT III : Chapter: 4

UNIT IV : Chapters: 12, 13

UNIT V : Chapters: 14,15

BOOK FOR REFERENCE

1. Stuart Russel, PeterNorvig, **"Artificial Intelligence a Modern Approach",** Second Edition, 2021.
2. Vorick Wilks, **"Artificial Intelligence",** Tata Mcgraw Hill, 2019.
3. Luca Massaron, John Mueller, **"Artificial Intelligence for Dummies"**, Tata McgrawHill, 2022.

WEB RESOURCES

1. https://nptel.ac.in/courses/106106140/
2. https://nptel.ac.in/courses/106106126/
3. https://www.udemy.com/course/artificial-intelligence-az/

FUNDAMENTALS OF STATISTICS

Semester: VI **Hours: 3**
Code : 23SE6CS04 **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 Moments, Correlation, and Theory of attributes, Probability and Random variables.	PSO - 1	K1
CO - 2	Understand the Moments, Correlation, and Theory of attributes, Probability and Random variables.	PSO - 2	K2
CO - 3	Apply the Moments, Correlation, and Theory of attributes, Probability and Random variables.	PSO - 3	K3
CO - 4	Analyze the Moments, Correlation, and Theory of attributes, Probability and Random variables.	PSO - 4	K4
CO - 5	Evaluate the Moments, Correlation, and Theory of attributes, Probability and Random variables.	PSO - 5	K5

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

Semester: VI							**FUNDAMENTALS OF STATISTICS**					**Hours: 3**
Code : 23SE6CS04												**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	3	3	3	5	5	3	3	2	3	3.18
CO - 2	4	2	3	5	5	3	3	5	4	2	3	3.55
CO - 3	5	3	4	3	3	2	2	3	5	3	4	3.36
CO - 4	3	5	3	3	3	2	2	3	3	5	3	3.18
CO - 5	3	3	5	3	3	4	4	3	3	3	5	3.55
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

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

UNIT II

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

UNIT III

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. (Sums only). **Independence and association of data:** Independent - Association and coefficient association - Associated - Positively associated - Negatively associated - Coefficient of association - Yule‟s coefficient. (Sums only).

(9 Hours)

UNIT IV

Probability: Introduction - Experiment - Random experiment - Sample space - Sample points - Event - Sure event - Impossible event - Relative frequency of the event - Probability set function - Uniform probability function - Mutually disjoint. (Sums only). **Conditional probability:** Multiplication theorem for probability - Independent - Pairwise independent - Mutually independent - Baye‟s theorem - Boole‟s inequality. (Sums only). **(9 Hours)**

UNIT V

Random variables: Introduction - Space of the random variable - Distribution function. Discrete random variable - Density function. Continuous random variable: Probability density function - Distribution function. (Sums only). **Mathematical expectations**: Mathematical expectation of continuous random variable - Mean value of X - r^{th} moment ofX - Standard deviation of X - r^{th} central moment of X. (Sums only). **(9 Hours)**

COURSE BOOK

1. Arumugam, Issac, **"Statistics"**, New Gamma Publishing House, Palayamkottai, June2018.

   UNIT I **:** Chapters: 4 (4.0- 4.2), 5 (5.0, 5.1)

   UNIT II **:** Chapter 6: (6.0 - 6.4)

   UNIT III **:** Chapter 8: (8.0- 8.3)

   UNIT IV **:** Chapter 11: (11.0 - 11.2)

   UNIT V **:** Chapter 12: (12.0 - 12.4)

BOOKS FOR REFERENCE

1. S. P. Gupta, Sultan Chand & Sons, **"Statistical Methods",** Educational Publishers,New Delhi, Forty First Revised Edition, 2011.
2. S. C. Gupta, V. K. Kapoor, "**Fundamentals of Mathematical Statistics",** Sultan Chand & Sons, New Delhi, Twelfth Edition, July 2020.

WEB RESOURCES

1. https://archive.nptel.ac.in/resources/statistics/
2. https://archive.nptel.ac.in/courses/111/105/111105090/
3. https://www.udemy.com/course/statistics-for-data-science-data-analytics/
4. https://www.coursera.org/learn/stanford-statistics

SOFTWARE TESTING

Semester: VI

Code : 23CS6SS01 **Credit: 2**

COURSE OUTCOMES:

- Remember the basics of software Testing, Flow graphs and Path Testing, Transaction-Flow, Data Flow, Domain, Interface, Syntax Testing, Metrics and Complexity.
- Understand software Testing, Flow graphs andPath Testing, Transaction-Flow, Data Flow, Domain, Interface, Syntax Testing, Metrics and Complexity.
- Apply software Testing, Flow graphs and PathTesting, Transaction-Flow, Data Flow, Domain, Interface, Syntax Testing, Metrics and Complexity.
- Analyze software Testing, Flow graphs and Path Testing, Transaction-Flow, Data Flow, Domain, Interface, Syntax Testing, Metrics and Complexity.
- Evaluate software Testing, Flow graphs and Path Testing, Transaction-Flow, Data Flow, Domain, Interface, Syntax Testing, Metrics and Complexity

UNIT I

Introduction: Productivity And Quality in Software-Goals for Testing-Test Design. Some Dichotomies: Testing Versus Debugging-Function Versus Structure-The Designer Versus the Tester. A Model for Testing: The Project-The Program - Bugs-Tests.

UNIT II

Flow graphs and Path Testing: Path-Testing Basics: Motivation and Assumptions- Control Flow graphs-Path testing. Predicates, Path Predicates, And Achievable Paths: Predicates- Predicate Expressions-Predicates Coverage-Testing Blindness. **Transaction- Flow Testing:** Transaction Flows-Transaction-Flow Testing Techniques.

UNIT III

Data Flow Testing: Data Flow Testing Strategies: Terminology-The Strategies Slicing, Dicing, Data Flow, and Debugging. **Domain Testing**: Domain Testing: Domain Bugs - Procedure**. Domains and Interface Testing:** Domains and Range.

UNIT IV

Metrics and Complexity: Linguistic Metric: Lines of Code - Statements Counts, and Related Metrics. Structural Metric: Cyclomatic Complexity-Other Structural Metrics. **Syntax Testing**: A Grammer Formats - Test case Generation-Implementation and application

UNIT V

Logic Based Testing: Decision Tables - Path Expressions Again-KV Charts. **States, State Graph, and Transition Testing**: State Tables-Time Versus Sequence- Software Implementation.

COURSE BOOK

1. Boris. Beizer, **"Software Testing Techniques**", Dream Tech India, Second Edition, New Delhi, 2003.

UNIT I	**:**	Chapter: 1
UNIT II	**:**	Chapters: 3, 4
UNIT III	**:**	Chapters: 5, 6
UNIT IV	**:**	Chapter: 7, 9
UNIT V	**:**	Chapter: 10, 11

BOOKS FOR REFERENCE

1. Burnstein, **"Practical Software Testing"**, Springer International Edition, 2003.
2. R. Rajani, and P.P. Oak, "**Software Testing"**, Tata Mcgraw Hill, NewDelhi, 2004.

WEB RESOURCES

1. https://onlinecourses.nptel.ac.in/noc20-cs19/preview
2. https://www.udemy.com/courses/development/software-testing/
3. https://www.coursera.org/learn/introduction-software-testing

WEB APPLICATION DEVELOPMENT USING LARAVEL

Semester: VI

Code : 23CS6SS02 **Credit: 2**

COURSE OUTCOMES:

- Remember the basics of Laravel, Setting Up a Laravel Development Environment, Artisan and Tinker, Blade Templating, Front End Components, Database Eloquent,User Authentication and Authorization, Writing API‟s.
- Understand Laravel Development Environment, Artisan and Tinker, Blade Templating, Front End Components, Database Eloquent, User Authentication and Authorization, Writing API‟s.
- Apply Laravel Development Environment, Artisan and Tinker, Blade Templating, Front End Components, Database Eloquent, User Authentication and Authorization, Writing API‟s.
- Analyze Laravel Development Environment, Artisan and Tinker, Blade Templating, Front End Components, Database Eloquent, User Authentication and Authorization, Writing API‟s.
- Evaluate Development Environment, Artisan and Tinker, Blade Templating, Front End Components, Database Eloquent, User Authentication and Authorization, Writing API‟s.

UNIT I

Laravel: Use a Framework - A Short History of Web and PHP Frameworks - Special of Laravel - Works of Laravel. Setting Up a Laravel Development Environment: System Requirements - Composer - Local Development Environments - Creating a New Laravel Project - Laravel's Directory Structure - Configuration. Artisan and Tinker: An Introduction to Artisan- Basic Artisan commands - Writing Custom Artisan Commands - Calling Artisan Commands in Normal Code.

UNIT II

Routing and Controllers: Route Definitions - Route Groups - Views-Controllers -Route Model Binding -Route Caching - Form Method Spoofing - CSRF Protection - Redirects - Aborting the Request - Custom Responses. **Blade Templating:** Echoing Data - Control Structures-Template Inheritance -View Composers and Service Injection - CustomBlade Directives.

UNIT III

Front End Components: Elixir - Pagination - Message Bags - String Helpers Pluralization and localization - Testing. **Collecting and Handling User Data:** Injecting a Request Object - Route Data - Uploaded Files -Validation - Form Requests - Eloquent Model Mass Assignment.

UNIT IV

Database Eloquent: Configuration - Migration - Seeding - Query Builder - Introduction to Eloquent - Eloquent Events. **User Authentication and Authorization:** The User Model and Migration - Using the auth() Global Helper and the Auth Façade.

UNIT V

Requests and Responses: Laravel's Request Life cycle - The Request Object - The Response Object - Laravel and Middleware. **Writing APIs:** The Basics of REST-Like JSON APIs - Controller Organization and JSON Returns -Reading and Sending Headers - Eloquent Pagination -Sorting and Filtering - Transforming Results.

COURSE BOOK

1. MattStauffer, **"LARAVEL Up and Running, A framework for building modern PHPApps"**, O'REILLY, First Edition, 2017.

UNIT I	**:**	Chapters	:	1, 2, 7
UNIT II	**:**	Chapters	:	3, 4
UNIT III	**:**	Chapters	:	5, 6
UNIT IV	**:**	Chapters	:	8, 9
UNIT V	**:**	Chapters	:	10, 13

BOOKS FOR REFERENCE

1. Martin Bean, **"Learning Laravel",** Packet Publishing, Latest Edition.
2. Fernando Monteiro, **"Hands-On Full-Stack Web Development with Angular 6 and Laravel 5",** Pack Publishing, Latest Edition.

WEB REFERENCES

1. https://laravel.com/docs/8.x
2. https://laravel-news.com/category/tutorials
3. https://www.tutorialspoint.com/laravel

PROGRAMMING SMART DEVICES

Semester: VI

Code : 23CS6SS03 **Credit: 2**

COURSE OUTCOMES:

- Remember the basics of React Native, Working with React Native, Components for Mobile, Styles, Platform APIs, Larger Applications, PHP and AJAX.
- Understand the React Native, Working with React Native, Components for Mobile, Styles, Platform APIs, Larger Applications, PHP and AJAX.
- Apply the React Native, Working with React Native, Components for Mobile, Styles, Platform APIs, Larger Applications, PHP and AJAX.
- Analyze the React Native, Working with React Native, Components for Mobile, Styles, Platform APIs, Larger Applications, PHP and AJAX.
- Evaluate the React Native, Working with React Native, Components for Mobile, Styles, Platform APIs, Larger Applications, PHP and AJAX.

UNIT I

React Native: Advantages of React Native. **Working with React Native:** React Native Work - Rendering Lifecycle - Creating Components in React Native - Working with Views-Using JSX- Styling Native Components- Host Platform APIs. **Building Your First Application:** Setting Up Your Environment - Creating a New Application- Exploring the Sample Code - Building a Weather App.

UNIT II

Components for Mobile: Analogies Between HTML Elements and Native Components - The <Text> Component- The <Image> Component- Working with Touch and Gestures- working with Lists - Navigation. **Styles:** Declaring and Manipulating Styles - Organization and Inheritance - Positioning and Designing Layouts.

UNIT III

Platform APIs: Using Geolocation - Accessing the User‟s Images and Camera - Storing Persistent Data with AsyncStorage - The Smarter Weather Application. **Modules and Native Code:** Installing JavaScript Libraries with npm- Installing Third - Party Components with Naïve Code - Objective C Native Modules - Java Native Modules - Cross- Platform Native Modules.

UNIT IV

Navigation and Structure in Larger Application: The Flashcard Application - Project Structure - Using React - Navigation- **State Management in Larger Applications:** Using Redux to Manage State - Actions - Reducers - Connecting Redux.

UNIT V

Introduction to PHP and Ajax: Origins and User of PHP - Overview of PHP - GeneralSyntactic Characteristics - Primitives, Operations, and Expressions - Output - Control Statements - Arrays - Functions - Pattern Matching - Form Handling - Cookies - Session Tracking - Overview of Ajax - The Basics of Ajax - Return Document Forms - Ajax Toolkits - Security and Ajax.

COURSE BOOK

1. Bonnie Eisenman, **"Learning React Native Building Mobile Applications with JavaScript",** O' Reilly Media, USA, Second Edition, 2016.

UNIT I : Chapter: 1, 3

UNIT II : Chapter: 4, 5

UNIT III : Chapter: 6, 7

UNIT IV : Chapter: 8, 9

UNIT V : Chapter: 10, 11

BOOKS FOR REFERENCE

1. Jakob Iversen, Michael Eierman, **"Learning Mobile App Development -A Hands-on Guide to Building Apps with iOS and Android",** Addison-Wesley, USA, 2014.
2. Nader Dabit, **"React Native in Action"** - Developing iOS and Android apps withJavaScript, Manning Publications Co. USA, 2019.
3. Nahum, Dotan, **"Programming React Native",** Leanpub, Canada, 2016.

WEB RESOURCES

1. https://onlinecourses.swayam2.ac.in/nou24-ge25/preview
2. https://onlinecourses.nptel.ac.in/noc24-me67/preview
3. https://www.udemy.com/course/mobile-device-management-fundamentals/
4. https://www.udemy.com/course/cryptography-and-cybersecurity-in-mobile-devices/
5. https://www.udemy.com/course/apple-macos-and-ios-system-administration- 2022/

SELF STUDY PAPER - QUESTION PATTERN (EXTERNAL)

Time: 3 Hours **Maximum Marks: 100**

PART A

I. Answer ANY Six out of Ten Questions. (Two Questions from each Unit) $6 \times 5 = 30$

PART B

II. Answer All the Questions (Either or Choice) (Two Questions from each Unit)

$5 \times 8 = 40$

PART C

III. Answer Any Three out of Five Questions (One Question from each Unit) $3 \times 10 = 30$

SKILL DEVELOPMENT PROGRAMME (SDP)

COMPUTER MAINTENANCE HARDWARE AND NETWORKING

(Affiliated to Mother Teresa University, Kodaikanal)

COURSE PATTERN

Theory: 30 Hours **Practical: 30 Hours** **Total: 60 hours**

Code	Title of the Paper	Hours	Credit
24CS1SD01	Computer Maintenance Hardware and Networking	2	2
24CS1SDP1	Computer Maintenance Hardware and Networking - Lab	2	1
Total (15 weeks x 4 = 60 hours)		**4**	**3**

COMPUTER MAINTENANCE HARDWARE AND NETWORKING

Code : 24CS1SD01 **Hours: 2** **Credit: 2**

UNIT I

Computers: Desktop Computer - Tablet - Laptop - Mainframe Computers - Super Computers - Features of Characteristics Computer - Components of Computer - Components of Desktop Systems - Components of Laptop - Components of Tablet - Types of Servers - Server Applications. **(6 Hours)**

UNIT II

Motherboard: Introduction - Motherboard: Components, Layout, Connections - Motherboards: Types and Features - Enhancing Features of Motherboard: Adding and or replacing components - Troubleshooting Problems of a Motherboard. **Processor and BIOS:** Processor - Multiple Core Processors - Co-processors - BIOS **(6 Hours)**

UNIT III

Hard Disk Drive: Introduction - Hard Disk Drive (HDD) - Hard Disk Interfaces - HDD Interfaces - EIDE - Serial ATA - SCSI Interface - USB - Firewire (IEEE 1394) - RAID- Solid-State Drive (SSD) - Disk Structure: HDD Disk Structure - Disk Performance Parameters Characteristics: Seeks and Latency, Data Transfer Rate - File System - FAT - NTFS - Unix File System - Hard Drives Partitioning **(6 Hours)**

UNIT IV

I/O and Modem: Troubleshoot I/O Devices - Switches - Keyboard - Mouse - Scanner - Webcam - Monitors - Printers - Speaker and Mike Problems - LCD Projector - I/O Cables - Video Graphics Adapter (VGA) or Super-VGA (SVGA) - Digital Visual Interface (DVI) - Audio I/O Port - Ethernet RJ45 (Registered Jack) Port - HDMI - PS/2 Port - Modem - Network Interface - Anti-Virus (AV). **6 Hours)**

UNIT V

Power Supply: Introduction - Switch Mode Power Supply (SMPS) - Purpose and Features of SMPS - Working of SMPS - Fault Finding in Power Supply - Uninterrupted Power Supply (UPS) - Types of UPS, Online and Offline - Preventive Maintenance of Power Supply. **(6 Hours)**

BOOK FOR STUDY

1. **"Computer Peripheral and Hardware Maintenance",** Dr. K. S. Wagh, Tech Knowledge Publications, Fifth Revised Edition, 2023.

    UNIT I : Chapter 1.1 - 1.3.2

    UNIT II : Chapters 2.1 - 2.5.5, 3.1 - 3.4.6

    UNIT III : Chapter 4.1 - 4.7

    UNIT IV : Chapter 5.1 - 5.4

    UNIT V : Chapter 6.1 - 6.5

BOOKS FOR REFERENCE

1. **"The Complete Reference PC Hardware",** Craig Zacker, John Rourke, McGraw Hill Education, 2017.
2. **"Modern Computer Hardware Course",** ManaharLotia, Pradeep Nair, PayalLotia, BPB Publications, 2017.

COMPUTER MAINTENANCE HARDWARE AND NETWORKING- LAB

Code : 24CS1SDP1 **Hours: 2** **Credit: 1**

1. Identification of Computer Parts and Connectors
2. Specifications of Desktop PC, Laptop and Server
3. Identify and Troubleshoot Motherboards
4. Configure BIOS Settings
5. Partition and Manage Hard Disk: Format Hard Drives with different File Systems.
6. Installation of Operating System (Windows Family, Linux Family)
7. Troubleshooting Hard Disk
8. Install Local Printer and Share Printer in Network
9. Set Keyboard, Mouse, Monitor, Speaker, Microphone and LCD Projector.
10. Assemble and Disassemble Desktop System
11. Use Diagnostic Software for Fault Finding Viruses

OPEN SOURCE WEB DEVELOPMENT WITH LAMP

(Affiliated to Mother Teresa University, Kodaikanal)

COURSE PATTERN

Theory: 30 Hours **Practical: 30 Hours** **Total: 60 hours**

Code	Title of the Paper	Hours	Credit
24CS1SD02	Open Source Web Development With Lamp	2	2
24CS1SDP2	Open Source Web Development With Lamp - Lab	2	1
	Total (15 weeks x 4 = 60 hours)	**4**	**3**

OPEN SOURCE WEB DEVELOPMENT WITH LAMP

Code: 24CS1SD02 **Hours: 2** **Credit: 2**

UNIT I

Open Source: Overview of open source software, Open source products, Development philosophy, Comparison between Open source, closed source, free software, and source-available, Pros and cons, Development tools. **(6 Hours)**

UNIT II

Linux Administration: Configuring the bash shell, Finding and processing files, Managing users, groups and permissions, Investigating and managing processes, Essential system administration tools. **Setting Environment:** Installing and configuring apache web server (Linux), Installing PHP (Linux),Introduction to PHP and MySQL, Identifying the prerequisites, Unpacking, configuring and compiling, Editing httpd.conf, Setting up access privileges, Restartingapache server.

(6 Hours)

UNIT III

Database Management Using MySQL: Getting started with MySQL, Installing MySQL on linux configuring your system, Creating databases, tables, and indexes, Inserting, deleting, and updating data, Querying MySQL, Working with advanced queries, Understanding the different join types using MySQL, Built-in functions with SELECT. **(6 Hours)**

UNIT IV

PHP: Getting started with PHP, Working with variables in PHP, Working with constants in PHP, Working with simple expressions and operators in PHP, Using control and looping statements, Working with advance program flow statement , Working with functions, Working with arrays, Storing data in arrays using PHP, Manipulating arrays. **(6 Hours)**

UNIT V

Processing Web Forms in PHP: Working with forms in PHP, Validating input data, Using magic quotes, File and directory access in PHP, PHP file handling, PHP directory handling, Working and formatting with strings, Investigating and manipulating strings, Saving form data: Saving form data using cookies, Saving form data using sessions. **Handling Databases:** Working with the DBA functions, Database integration-SQL. **(6 Hours)**

BOOK FOR STUDY

Study Material-By the Department

BOOKS FOR REFERENCE

1. **"Professional LAMP Linux, Apache, MySql and PHP5 Web development"**, Jason Gerner, Elizabeth Naramore, Morgan L. Owens, Matt Warden, Wiley Publications, 2006.
2. **"Beginning PHP 5.3"**,Matt Doyle, Wiley Publications, 2010.

OPEN SOURCE WEB DEVELOPMENT WITH LAMP - LAB

Code: 24CS1SDP2 **Hours: 2** **Credit: 1**

1. Installation and setting up of LAMP environment

LINUX

2. Basic Commands in Linux
3. Shell programming with control structures

PHP & MySQL

4. Develop a PHP program using controls and functions
5. Develop a PHP program using String function and Arrays.
6. Develop a PHP program using parsing functions (use Tokenizing)
7. Develop a PHP program and check Regular Expression, HTML functions, Hashing functions.
8. Develop a PHP program and check File System functions, Date and time functions.
9. Creating a form for various operation SQL queries using PHP
10. Develop a PHP program to display student information using MYSQL table.
11. Develop a college application form using MYSQL.

ONLINE SKILL DEVELOPMENT COURSES - Via JACTILE

(Affiliated to Mother Teresa Women's University, Kodaikanal)

Basic Courses: (8 weeks - 1 Credit)

1. Python Fundamentals - 24CS1SD03
2. R for Beginners - 24CS1SD04
3. Laravel for Beginners - 24CS1SD05
4. Crash Course on ReactJS - 24CS1SD06

Advanced Courses: (16 Weeks - 2 Credit)

5. Advanced Programming in Python - 24CS2SD01
6. Advanced Analytics usingR - 24CS2SD02
7. Data Analytics with Python - 24CS2SD03
8. Full stack Web Development Bootcamp - 24CS2SD04

PYTHON FUNDAMENTALS

Code: 24CS1SD03 **Weeks: 8** **Hours: 5** **Credit: 1**

WEEK 1

Introduction to Python: Structure of a Python Program - Elements of Python- Python Interpreter - Using Python as calculator - Python shell - Indentation. Atoms - Identifiers and keywords - Literals - Strings and Operators. **(5 Hours)**

WEEK 2

Conditional Statements and Looping: Branching Looping, Conditional Statement, Exit function, Difference between break, continue and pass. **String Manipulation:** Understanding string, Accessing Strings, Basic Operations, String slices, Function and Methods. **(5 Hours)**

WEEK 3

List: Introduction to list, Accessing list, list operations, Working with lists, Function and Methods. **Tuples:** Introduction to tuple, Accessing tuples, Operations, Working, Functions and Methods. **(5 Hours)**

WEEK 4

Dictionary: Introduction to dictionaries, Accessing values in dictionaries, Working with dictionaries, Properties, Functions. **(5 Hours)**

WEEK 5

Python Functions: Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables, Organizing python codes using functions. **(5 Hours)**

WEEK 6

Python Modules: Organizing python projects into modules, Importing own module as well as external modules, Understanding Packages, modules and external packages. **(5 Hours)**

WEEK 7

Input-Output: Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions. **(5 Hours)**

WEEK 8

Exception Handling: Introduction to Exception, Exception Handling, Except clause, Try? finally clause, User Defined Exceptions.**(5 Hours)**

BOOKS FOR REFERENCE

1. **"Introduction to Computing and Problem solving using Python",** E. Balagurusamy, McGraw Hill Education Private Ltd., I Edition, Reprint 2022
2. **"Problem Solving and Python Programming",** S.A. Kulkarni, Yes Dee Publishing Pvt. Ltd., Second Edition, 2018.
3. **"Python Programming using Problem Solving Approach",** Reema Thareja, Published by Oxford Higher Education, 2017.
4. **"Think Python, 2e: How to Think Like a Computer Scientist",** B. Downey, O'Reilly, 2015.
5. **"LEARN PYTHON 3 THE HARD WAY",** Z. Shaw,Addison-Wesley, 2017.
6. **"Problem Solving and Python Programming",** Arockia Mary P,Shanlax Publications, 2021.

WEB REFERENCES

1. https://onlinecourses.nptel.ac.in/noc23_cs99/preview
2. https://www.udemy.com/course/python-beginner-to-advanced-level-course/
3. https://www.coursera.org/specializations/python
4. https://www.coursera.org/learn/python-crash-course
5. https://www.udemy.com/course/python-coding/
6. https://www.coursera.org/learn/codio-advanced-django-advanced-drf

R FOR BEGINNERS

Code: 24CS1SD04 **Weeks: 8** **Hours: 5** **Credit: 1**

WEEK 1

Getting R: Downloading R- R Version-32-bit versus 64 -bit- Installing - Revolution - R Community Edition- **The R Environment:** Command Line Interface- RStudio - Revolution analytics RPE- R Packages: Installing Packages Loading Packages- Building a packages **(5 Hours)**

WEEK 2

Basics of R: Basic Math- Variables -data types - Vectors- Calling Functions- Function Documentation- Missing data. **Advanced Data Structures:** Dataframes- Lists- Matrices-Arrays. **(5 Hours)**

WEEK 3

Reading Data into R: Reading CSVs-Excel data-Reading from databases-Data from other Statistical Tools- R Binary Files- Data included with R- Extract Data from Web Sites. **(5 Hours)**

WEEK 4

Writing R Functions: Hello, world!- Function Arguments- Return Values - do..call- **Control Statements:** if and else- switch- ifelse - Compound Tests. **Loops, the Un - R Way to Iterate:** for loops - while loops- controlling loops.

(5 Hours)

WEEK 5

Manipulating Strings: paste - sprint - Extracting Text - Regular Expressions

(5 Hours)

WEEK 6

Data Visualization: Importance of Data Visualization - Data Visualization for Machine Learning - Data Visualization Techniques. **(5 Hours)**

WEEK 7

Data Visualization for Simple Data Visualization Using R: Generic Plot - Scatter Plot - Strip Chart - Stacked Bar Plot - Grouped Bar Plot - Pie Chart - Kernel Density Plot. **(5 Hours)**

WEEK 8

Data Visualization Using Ggplots in R: Scatter Plot - Line Plot - Boxplot - Violin

Plot - Ridge Plot. **(5 Hours)**

BOOKS FOR REFERENCE

1. **"R for Everyone Advanced Analytics and Graphics",** Jared P. Lander, Pearson Education, 2015.
2. **"Data Analytics with R Programming",** V. Bhuvaneswari, Scitech Publications (India) Pvt Ltd, 2018
3. **"Data Analytics Using R",** Seema Acharya, McGraw Hill Education, First Edition 2018.
4. **"R Programming an Approach to Data Analytics",** G Sudhamathy, C Jothi Venkateswaran, MJP Publishers, 2021.

WEB REFERENCES

1. https://www.coursera.org/learn/data-analysis-r
2. https://www.coursera.org/specializations/statistics
3. https://www.coursera.org/specializations/data-science-foundations-r?
4. https://www.udemy.com/course/r-level1/
5. https://www.udemy.com/course/r-programming/

LARAVEL FOR BEGINNERS

Code: 24CS1SD05 **Weeks: 8** **Hours: 5** **Credit: 1**

WEEK 1

OVERVIEW OF Laravel: Introduction of Laravel - Features of Laravel - History of Laravel - Introduction of MVC Pattern - Laravel Directory Structure - **Installation:** XAMPP Installation - Composer Installation - Git Installation - Laravel Application Structure. **(5 Hours)**

WEEK 2

Laravel Routing: Laravel Basic Routing - Routing Parameters - Laravel Named Routes - Laravel Middleware - Laravel Route Groups - **Laravel Controllers:** Laravel Controllers - Routing Controllers - Resource Controllers - Controller Middleware - Laravel Views: Laravel Views -Passing data to views. **(5 Hours)**

WEEK 3

Laravel Blade Template: Display Images - Make Anchor - Displaying Variables - Conditional Statements - Loop in blade - PHP function - Build Your Master layout - Extending the master layout - nested views - Include Views - Adding assets.

(5 Hours)

WEEK 4

Using Forms and Gathering Input: Adding HTML 5 Package - Creating A form using Blade Syntax - Validating user input - File Uploading - Error message Handling - Encrypting and decrypting data - Preserving the data **(5 Hours)**

WEEK 5

Laravel Migration: Laravel Migration - Migration Structure - Generating Migrations - Migration Commands **(5 Hours)**

WEEK 6

Security & Session: Removing Public from URL -Sessions Effective **(5 Hours)**

WEEK 7

Laravel Database - Introduction Model - Type of Database using - Eloquent ORM Model - Naming Convention - Table name - Primary key - Timestamps - Use model

(5 Hours)

WEEK 8

Display data from models in views - Manage Mass Assignment - CRUDS Operation - Fluent - Simple Query String - CRUDS Operation - Query Builder - CRUDS Operation **(5 Hours)**

BOOKS FOR REFERENCE

1. **"Beginning Laravel: Build Websites with Laravel 5.8",** Sanjib Sinha, aPress, 2019
2. **"Laravel: Up & Running - A Framework for Building Modern PHP Apps"**, Matt Stauffer, O'Reilly Publication, Second Edition, 2019
3. **"Mastering Laravel",** A Scholtens, Sas155 Publisher 2023,

WEB REFERENCES

1. https://www.udemy.com/course/laravel-beginner-fundamentals
2. https://www.coursera.org/specializations/secure-coding-in-laravel
3. https://www.coursera.org/learn/secure-coding-in-laravel-course-1
4. https://www.udemy.com/course/laravel-blog-development/

CRASH COURSE ON REACTJS

Code: 24CS1SD06 **Weeks: 8** **Hours: 5** **Credit: 1**

WEEK 1

ReactJS - Introduction - ReactJS - Installation - ReactJS- Architecture **(5 Hours)**

WEEK 2

React - Creating a React Application - React - JSX **(5 Hours)**

WEEK 3

ReactJS - Component- React - Styling - React - Properties (props) - React **(5 Hours)**

WEEK 4

Event management - React - State Management - React - Http client programming **(5 Hours)**

WEEK 5

React - Form programming - React-Routing **(5 Hours)**

WEEK 6

React - Redux - React - Animation - React -Testing- React - CLI Commands - React - Building and Deployment **(5 Hours)**

WEEK 7

React -Example **(5 Hours)**

WEEK 8

Online Examination **(5 Hours)**

BOOKS FOR REFERENCE

1. **"React JS Made Easy: A Beginner's Guide To Easily Learn React JS",** Magige Robi, Programming Ebooks, Kindle Edition, 2021
2. **"React.js Design Patterns: Learn how to build scalable React apps with ease"**, Anthony Onyekachukwu Okonta, BPBPublication, 2023
3. **"React.Js Programming, In 8 Hours, For Beginners, Learn Coding Fast: React.Js Language, Crash Course Textbook & Exercises",**Ray Yao, Ada C. Perl, Kafka R. Swift,Quick Start GuideCode Book; FourthEdition,2022
4. **"React JS: From Basics to Advanced - A Comprehensive 3-in-1 Guide to Effortless Web Development for Beginners, Intermediates, and Experts"**, Vivian Walker, Kindle Edition, 2023
5. **"React.js For Beginners",** Mayur Patil, Notion Press, 2023

WEB REFERENCES

1. https://www.udemy.com/course/react-the-complete-guide-incl-redux/
2. https://www.udemy.com/course/the-ultimate-react-course/
3. https://www.udemy.com/course/react-tutorial-and-projects-course/
4. https://www.udemy.com/course/complete-react-developer-zero-to-mastery/

ADVANCED PROGRAMMING IN PYTHON

Code: 24CS2SD01 **Weeks: 16** **Hours: 5** **Credit: 2**

WEEK 1

Object Oriented Python - a recap: Assertion, Decorators, Generators and Iterators **(5 Hours)**

WEEK 2

Threading in Python: Creation, Execution of threads using threading module **(5 Hours)**

WEEK 3

Database programming using Python: Connecting to a database (sqlite) using Python - Sending DML and DDL queries and processing the result from a Python Program **(5 Hours)**

WEEK 4

Network programming using Python: An introduction to client-server programming - Basics of TCP and UDP protocols - Introduction to socket programming - Building an HTTP client and server **(5 Hours)**

WEEK 5

GUI in Python: Introduction to GUI building libraries - Widgets - Button - Canvas - Checkbutton - Entry - Frame - Label - Listbox - Menubutton - Menu - Message - Radiobutton - Scale - Scrollbar - Text - Toplevel - Spinbox - PanedWindow - LabelFrame-tkMessageBox **(5 Hours)**

WEEK 6

Basic image processing using Python: Introduction to digital image processing - Basic operations on an image - Crop - Scale - Rotate - Flip - Changing contrast, brightness and color - Edge detection, blur, sharpening **(5 Hours)**

WEEK 7

Basic numerical processing using Python: Introduction to numpy - Creation of vectors and matrices - Matrix manipulation **(5 Hours)**

WEEK 8

Basing data analysis using Python: Introduction to Pandas - Pandas data structures - Series and DataFrame **(5 Hours)**

WEEK 9

Data wrangling using pandas: Loading a dataset into a dataframe - Selecting Columns from a dataframe - Selecting Rows from a dataframe - Adding new data in a dataframe - Deleting data from a dataframe **(5 Hours)**

WEEK 10

Basic data visualization using Python: Introduction to Matplotlib -Scatter plot - Line plot - Bar chart - Histogram-Box plot **(5 Hours)**

WEEK 11

Regular expression: RE package **(5 Hours)**

WEEK 12

Web Scrapping: Beautiful Soup **(5 Hours)**

WEEK 13

Case Study - 1

WEEK 14

Case Study - 2

WEEK 15

Case Study - 3

CASE STUDIES: All these case studies are for practice purpose for students.

1. Write a python function which accepts a sentence and returns a list in which first value is the count of upper case letters and second value is the count of lower case letters in the sentence. Ignore spaces, numbers and other special characters if any.
2. WeCare insurance company wants to calculate premium of vehicles. Vehicles are of two types - "Two Wheeler" and "Four Wheeler". Each vehicle is identified by vehicle id, type, cost and premium amount. Premium amount is 2% of the vehicle cost for two wheelers and 6% of the vehicle cost for four wheelers. Calculate the premium amount and display the vehicle details
3. Retrieve and process some data and then use the Google Maps API to visualize our data

BOOKS FOR REFERENCE

1. **"Advanced Python Programming: Accelerate your Python programs using proven techniques and design patterns"** Quan Nguyen**,** Packt Publishing Limited, 2nd edition, 2022
2. **"Advanced Python Programming: Build high performance, concurrent, and multi-threaded apps with Python using proven design patterns",** Sakis Kasampalis, Quan Nguyen, Dr Gabriele Lanaro, Dr. Gabriele Lanaro, Ingram short title, 2019
3. **"Expert Python Programming: Master Python by learning the best coding practices and advanced programming concepts",** Michał Jaworski, Tarek Ziadé, Packt Publishing Limited, 4th Edition, 2021
4. **"Core Python Programming, 3ed: Covers fundamentals to advanced topics**

like OOPS, Exceptions, Data structures, Files, Threads, Net", R. Nageswara Rao, Dreamtech Press, 2021

5. **"Think Python, 2e: How to Think Like a Computer Scientist",** B. Downey, O'Reilly, 2015.

WEB REFERENCES

1. https://www.udemy.com/course/100-days-of-code/
2. https://www.udemy.com/course/complete-python-developer-zero-to-mastery/
3. https://www.udemy.com/course/complete-python-programming-masterclass-beginner-to-advanced/
4. https://www.udemy.com/course/the-python-pro-course/
5. https://www.udemy.com/course/complete-python-bootcamp/

ADVANCED ANALYTICS USING R

Code: 24CS2SD02 **Weeks: 16** **Hours: 5** **Credit: 2**

WEEK 1

Introduction to R: R and RStudio Environment - RStudio Environment - Four Windows in RStudio. **(5 Hours)**

WEEK 2

Basics of R : Set Working Directory in R - Comment Statements in R - Variables in R - Data Types in R - Operators in R - Functions in R - Vectors in R - Lists in R - Data Frames in R - Packages in R. **(5 Hours)**

WEEK 3

Exploratory Data Analysis: Steps in Data Pre-processing - Understanding Data - Steps Involved in EDA Using R Programming - Looking at the Data. **(5 Hours)**

WEEK 4

Dealing with Missing Values: Replacing "na" Values of Continuous Variables with Mean Mean Imputation - Replacing the "na" Values of Continuous Variables with Mean: Median Imputation - Replacing the "na" Values of Categorical Variables with Mode: Mode Imputation. **(5 Hours)**

WEEK 5

Data Visualization: Importance of Data Visualization - Data Visualization for Machine Learning - Data Visualization Techniques**. Simple Data Visualization Using R:** Generic Plot - Scatter Plot - Strip Chart - Stacked Bar Plot - Grouped Bar Plot - Pie Chart - Kernel Density Plot. **(5 Hours)**

WEEK 6

Data Visualization Using Ggplots in R: Scatter Plot - Line Plot - Boxplot - Violin Plot - Ridge Plot. **Dimensionality Reduction Techniques:** Dimensionality Reduction - Independent and Dependent Variables. **Relationship between Variables:** Correlation: Application of Factor Analysis using R Programming - Multicollinearity. **(5 Hours)**

WEEK 7

Factor Analysis: Eigen Value - Scree Plot - Unrotated Factor Matrix - Rotated Factor Matrix. Unsupervised Learning Algorithms: Introduction **(5 Hours)**

WEEK 8

Association Rule Mining: Transaction Dataset - Support - Confidence - Lift - Apriori Algorithm - Association Rule - Plotting of Rules. **Conjoint An analysis:** Full and Fractional Factorial Design - Choice Cards - Attribute Importance.

(5 Hours)

WEEK 9

Supervised Learning Algorithms: Decision Tree and Random Forest: Decision Tree - Tree Structure - Criteria for Splitting Decision Node. **(5 Hours)**

WEEK 10

Classification and Regression Technique: Control Parameters - Pruning the Tree - Model Performance Measures - Insights from Decision Rules. **(5 Hours)**

WEEK 11

Random Forest: Control Parameters - Out of Bag Error Rate - Tuning the Random Forest - Variable Importance Plot - Model Performance Measures. **Supervised Learning Algorithm:** K-Nearest Neighbors: Similarity Based on Distance Function - Select Appropriate K Value **(5 Hours)**

WEEK 12

KNN Model Building - Model Performance Measures. **Naive Bayes Algorithm:** Types of Naïve Bayes Theorem - Building Naïve Bayes Classifier - Model Performance Measures. **(5 Hours)**

WEEK 13

Case Study - 1

WEEK 14

Case Study - 2

WEEK 15

Case Study - 3

BOOKS FOR REFERENCE

1. **"Introduction to Data Science Practical Approach with R and Python",** B. Uma Maheshwari and R. Sujatha, Wiley India Pvt. Ltd., First Edition, 2021
2. **"Data Analytics With R Programming",** V. Bhuvaneswari, Scitech Publications (India) Pvt Ltd, 2018
3. **"Data Analytics Using R",** Seema Acharya, McGraw Hill Education, First Edition 2018.
4. **"R Programming an Approach to Data Analytics",** G Sudhamathy, C Jothi Venkateswaran, MJP Publishers, 2021.

WEB REFERENCES

1. https://www.coursera.org/learn/data-analysis-r
2. https://www.coursera.org/specializations/statistics
3. https://www.coursera.org/specializations/data-science-foundations-r?
4. https://www.udemy.com/course/r-level1/
5. https://www.udemy.com/course/r-programming/

DATA ANALYTICS WITH PYTHON

Code: 24CS2SD03 **Weeks: 16** **Hours: 5** **Credit: 2**

WEEK 1

Software Development, Data types and Expressions: Strings, Assignment, and Comments - Numeric Data types and Character sets - Expressions **(5 Hours)**

WEEK 2

Loops and Selection Statements: Definite iteration: the for Loop - selection: if and if-else statements - Conditional iteration: the while Loop - **Strings and Text Files:** Accessing Characters and substrings in strings - Data encryption - Strings and Number systems- String methods - Text files. **(5 Hours)**

WEEK 3

Lists and Dictionaries: Lists - Dictionaries - **Design with Functions:** A Quick review - Problem Solving with top-Down Design - Design with recursive Functions - Managing a Program's namespace - Higher-Order Functions. **(5 Hours)**

WEEK 4

Design with Classes: Getting inside Objects and Classes - Data-Modeling Examples - Building a New Data Structure: The Two - Dimensional Grid - Structuring Classes with Inheritance and Polymorphism. **(5 Hours)**

WEEK 5

Graphical User Interfaces - The Behavior of terminal-Based programs and GUI-Based programs - Coding Simple GUI-Based programs - Windows and Window Components - Command Buttons and responding to events. **(5 Hours)**

WEEK 6

The NumPy Library: Ndarray: The heart of the Library - Basic Operations - Indexing, Slicing and Iteration - Array manipulation. **The Pandas Library-An Introduction**: The Series - The Data Frame - The Index Objects. **(5 Hours)**

WEEK 7

Data Visualization with Matplotlib: The Matplotlib Architecture - pyplot - The Plotting Window - Adding Elements to the Chart - Line Charts - Bar Charts - Pie charts. **(5 Hours)**

WEEK 8

Introduction to Data Science: Functional Programming - JSON and XML in Python - NumPy with Python - Pandas - Visualization with Matplotlib: General Matplotlib Tips - Two Interfaces for the Price of One - Simple Line Plots - Visualizing Errors - Density and Contour Plots - Histograms, Binnings, and Density

(5 Hours)

WEEK 9

Customizing Matplotlib: Configurations and Stylesheets - Three-Dimensional Plotting in Matplotlib - Geographic Data with Basemap - Visualization with Seaborn. **(5 Hours)**

WEEK 10

Descriptive Measures: Averages or Measures of Central Tendency - Arithmetic Mean - Median - Mode - Geometric Mean - Harmonic Mean - Selection of an Average - Partition Values - Dispersion - Measures of Dispersion - Coefficient of Dispersion - Moments - Skewness - Kurtosis. **(5 Hours)**

WEEK 11

Theory of Probability: Basic Terminology - Mathematical or Classical Probability - Statistical or Empirical Probability - Subjective Probability - Conditional Probability - Multiplication Theorem of Probability - Independent Events - Baye's Theorem. **(5 Hours)**

WEEK 12

Correlation: Meaning of Correlation - Scatter Diagram - Karl Pearson Coefficient of Correlation **(5 Hours)**

WEEK 13

Curve Fitting and Regression Analysis: Linear Regression - Curvilinear Regression - Regression Curves **(5 Hours)**

WEEK 14

Multiple and Partial Correlation and Regression Analysis: Multiple and Partial Correlation and Regression - Plane of Regression - Coefficient of Multiple Correlation - Coefficient of Partial Correlation. **(5 Hours)**

WEEK 15

Case Study - 1

WEEK 16

Case Study - 2

BOOKS FOR REFERENCE

1. **"Fundamentals of Python: first programs",** K.A. Lambert, Second Edition, Cengage Learning, 2018.
2. **"Python Data Analytics: With Pandas, NumPy, and Matplotlib",** Fabio Nelli Second Edition, Kindle Edition, 2018.

WEB REFERENCES

1. https://onlinecourses.nptel.ac.in/noc24_cs20/preview
2. https://www.udemy.com/course/data-analytics-python/
3. https://www.udemy.com/course/data-analysis-with-pandas/
4. https://www.coursera.org/learn/python-data-science

FULL STACK WEB DEVELOPMENT BOOTCAMP

Code: 24CS2SD04 **Weeks: 16** **Hours: 5** **Credit: 2**

WEEK 1

Web Basics - HTML, CSS, JS, Debugging, DOM, Git/hub, Terminal **(5 Hours)**

WEEK 2

Web Basics Drill Down - Scope, JS this, jQuery, CSS Responsive & Modern Design, Grid, MVC, Modules. **(5 Hours)**

WEEK 3

AJAX - Templates, & OOP - JSON, Handlebars, HTTP, APIs. **(5 Hours)**

WEEK 4

OOP Basics, Inheritance & Polymorphism, UMLs **(5 Hours)**

WEEK 5

Servers - Node, NPM, Express, CRUD, Middleware, Promises **(5 Hours)**

WEEK 6

Databases - FullStack Mongo, Mongoose, Population, Event Loop, JS async/await, Git Branching, Collaboration, Heroku. **(5 Hours)**

WEEK 7

Data Structures & Algorithms -Time Complexity (Big O), Recursion, Sets, Stacks, Queues, Matrices, Trees. **(5 Hours)**

WEEK 8

React -Virtual DOM, JSX, Components, State, Props, Events, Routing, Lifecycle **(5 Hours)**

WEEK 9

MobX - Stores, Observables, Actions, Computed Values, Provider, Injection. **(5 Hours)**

WEEK 10

SQL -Basic Commands, Relationships Joins, Sequelize. **(5 Hours)**

WEEK 11

Miscellaneous -Testing, CSS Material, CSS LESS, Enrichment Content. **(5 Hours)**

WEEK 12

Project -Hands-on work beyond exercises including minigames. **(5 Hours)**

WEEK 13

Project -Weather App. **(5 Hours)**

WEEK 14

Project - CRM system, and more.

WEEK 15

Hackathons - Mid-Hackathon, Final Project

BOOKS FOR REFERENCE

1. **"Full Stack Web Development for Beginners: Learn Ecommerce Web Development Using HTML5, CSS3, Bootstrap, JavaScript, MySQL, and PHP",** Riaz Ahmed, Independently Publisher, 2021
2. **"Full Stack Web Development: The Comprehensive Guide",** Philip Ackermann, Shroff/Rheinwerk Computing Publisher, First Edition, 2023
3. **"Full Stack Web Development: Everything Beginners to Expert Guide on Modern Full-Stack Web Development Using Modern Web Development Tools",** Sammie Smith, Kindle Edition, 2022

WEB REFERENCES

1. https://www.udemy.com/course/the-complete-web-development-bootcamp/
2. https://www.udemy.com/course/fullstack-web-development-course-projects-base/
3. https://www.udemy.com/course/the-ultimate-fullstack-web-development-bootcamp/
4. https://www.udemy.com/course/complete-web-development-course/

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**