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.

SYLLABUS 2020 - 2023

B. SC. COMPUTER SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. COMPUTER SCIENCE SYLLABUS

As per the guidelines of the UGC, TANSCHE and 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 Generic Elective Courses.

EXTRA CREDIT COURSES

At the end of the fourth semester, (in summer holidays) the students should undergo an Internship cum Mini project and viva voce will be conducted in the first week of the fifth semester. They should submit an Internship cum Mini Project report at the time of viva-voce examination and can earn 2 more credits. Students can opt for a MOOC in Self-paced Learning 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 Internship cum Mini Project and Self Study paper, 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 cum Mini Project	100	-	**100**

Components for Continuous Internal Assessment (CIA) - Theory

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

Components for Continuous Internal Assessment (CIA) - Practical

Component	Mark
Internal Test (2)	15
Lab Work	10
Record	10
Attendance	05
Total	**40**

Project and Mini Project

Project		Internship cum Mini Project	
Review (2)	25	Project Execution & Output	30
Project Execution	10	Viva	30
Record	10	Presentation	20
Attendance	05	Report	20
Total	**50**	**Total**	**100**

AECC 1: Professional English for Computer Science

Component	Mark
Internal Test (2)	30 + 30
Listening Comprehension (Group Discussion)	10
Speaking Comprehension (Situational Conversation)	10
Reading Comprehension (Article Reading)	10
Writing Comprehension (Report Presentation)	10
Total	**100**

Skill Enhancement Compulsory Course- I and Generic Electives

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

Skill Enhancement Compulsory Course - 4

Component	Marks
Internal test I	30
Internal test II	30
Online Quiz	30
Assignment	5
Attendance	5
Total	**100**

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

EVALUATION PROCEDURE FOR 20CS3MC05 & 20CS3MC07

Based on the course content, the external examination will be conducted for 37.5 marks for 2 hours each. But, the marks will be converted to 75 by the external paper valuator for technical purpose. Continuous Internal Assessment (CIA) will be evaluated as other theory papers.

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)

INTERNAL QUESTION PATTERN FOR AECC 1 AND SECC 1 & 4 (1 Hour)

PART - A

20 Questions × 1Mark =20 Marks

PART - B

Questions × 5 Marks = 10 Marks (Internal Choice)

EXTERNAL QUESTION PATTERN

PART - A

10 Questions × 1Mark = 10 Marks

(Two Questions from each Unit)

PART - B

5 Questions × 5 Marks = 25 Marks

(Internal Choice and one set of Question from each Unit)

PART - C

4 Questions × 10 Marks = 40 Marks (4 Questions out of 6)

(Open Choice and at least one Question from each Unit)

EXTERNAL QUESTION PATTERN FOR 20CS3MC05 & 20CS3MC07

PART - A

10 Questions × 1Mark =10 Marks (2 Questions from each Unit)

PART - B

3 Questions × 5 Marks = 15 Marks (3 Questions out of 5)

(Open Choice and one Question from each Unit)

PART - C

1 Question × 12.5 Marks = 12.5 Marks (2 Questions out of 3)

(Internal Choice and at least one Question from 2^{nd} - 5^{th} Units)

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) $3 \times 10 = 30$

U.G. PROGRAMME OUTCOMES

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.

U.G. COMPUTER SCIENCE PROGRAM SPECIFIC OUTCOMES

PSO NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO-1	Acquire the basic fundamental domain knowledge for developing effective computing solutions for Mathematics and Electronics.	PO -1 PO - 2 PO - 3
PSO-2	Develop the analytical mind, critical and logical thinking to apply mathematical foundations, algorithmic principles, and computing theories in the modeling and design of computer- aided systems for employability and entrepreneurship skills.	PO - 1 PO - 2 PO - 3 PO - 5 PO - 6
PSO-3	Create computing professionals through in-depth training in programming languages to cater the technological changes.	PO - 2 PO - 3
PSO-4	Develop leadership qualities, good communication on teams to accomplish shared computing design and evaluation or implementation goals through projects.	PO - 4 PO - 5 PO - 6
PSO-5	Inculcate the professional, ethical, legal knowledge on security and social issues with social responsibility.	PO - 2 PO - 5

UG COURSE PATTERN - 2020 - 2023 (UGC/ TANSCHE/ MTU)

Sem.	Part	Code	Title of the Course	Hours	Credits
I	I	20GT1GS01/ 20GH1GS01/ 20GF1GS01	Tamil - I Hindi - I French - I	6	3
	II	20GE1GS01	English - I	6	3
	III	20CS1MC01	Programming in C	5	5
		20CS1CP01	Programming in C - Lab	4	2
		20CS1AC01	Mathematical Foundation for Computer Science	5	4
	IV	20CS1AE01	**Ability Enhancement Compulsory Course (AECC)- 1:** Professional English for Computer Science	2	2
	IV	20SE1CE1A	**Skill Enhancement Compulsory Course (SECC)- 1:** Computer Fundamentals	2	2
	V	20STPNS01/ 20STPNC01/ 20STPPE01/ 20STPCC01/ 20STPRR01/ 20STPRC01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	-
			Total	**30**	**21**
II	I	20GT2GS02 20GH2GS02 20GF2GS02	Tamil - II Hindi-II French-II	6	3
	II	20GE2GS02	English - II	6	3
	III	20CS2MC02	Object Oriented Programming with C++	4	4
		20CS2CP02	Object Oriented Programming-Lab	3	2
		20CS2MC03	Web Designing	2	2
		20CS2AC02	Computer Oriented Numerical Methods	5	4
	IV	20AE2ES02	**Ability Enhancement Compulsory Course (AECC)- 2:** Environmental Studies	2	2
	IV	20SE2CB02	**Skill Enhancement Compulsory Course (SECC)- 2:** Capacity Building	2	2

Sem.	Part	Code	Title of the Course	Hours	Credits
II	V	20STPNS01/ 20STPNC01/ 20STPPE01/ 20STPCC01/ 20STPRR01/ 20STPRC01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	-
			Total	**30**	**22**
III	I	20GT3GS03/ 20GH3GS03/ 20GF3GS03	Tamil - III Hindi - III French - III	6	3
	II	20GE3GS03	English - III	6	3
	III	20CS3MC04	Programming in JAVA	4	4
		20CS3MC05	Optimization Techniques - I	2	2
		20CS3AC03	Digital Electronics	3	3
		20CS3DE1A/ 20CS3DE1B/ 20CS3DE1C/	Computer Organization and Architecture / Cloud Computing / Embedded Systems	4	3
		20CS3CP03	Programming in JAVA - Lab	3	2
		20CS3AP01	Digital Electronics - Lab	2	1
	V	20STPNS01/ 20STPNC01/ 20STPPE01/ 20STPCC01/ 20STPRR01/ 20STPRC01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	-
			Total	**30**	**21**
IV	I	20GT4GS04/ 20GH4GS04/ 20GF4GS04	Tamil - IV Hindi - IV French-IV	6	3
	II	20GE4GS04	English - IV	6	3

Sem.	Part	Code	Title of the Course	Hours	Credits
IV	III	20CS4MC06	Microprocessor	4	4
		20CS4MC07	Optimization Techniques - II	2	2
		20CS4AC04	Computer Graphics	3	3
		20CS4DE2A/ 20CS4DE2B/ 20CS4DE2C	Data Structures and Computer Algorithms / Compiler Design/ Distributed Systems	4	3
		20CS4CP04	Microprocessor - Lab	3	2
		20CS4AP02	Animation - Lab	2	1
	V	20STPNS01/ 20STPNC01/ 20STPPE01/ 20STPCC01/ 20STPRR01/ 20STPRC01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	2*
	V	20SLPEX01	**Service Learning Programme** - Extension JACEP	-	-
			Total	**30**	**21 + 2***
V	III	20CS5MC08	Web Application Development	4+1	5
		20CS5MC09	Database Management Systems	4+1	5
		20CS5MC10	Operating Systems	4	4
		20CS5DE3A/ 20CS5DE3B/ 20CS5DE3C	Software Engineering / System Modeling and Simulation / Blockchain Technology	4	3
		20CS5CP05	Web Application Development - Lab	5	3
		20CS5CP06	Database Management Systems- Lab	5	3
	IV	20CS5GE01/ 20GE5NC01	Web Designing - Lab (S to S)/ NCC - National Integration and Personality Development	2	2
	IV	20SE5AB03	**Skill Enhancement Compulsory Course (SECC) - 3:** Aptitude building - I	2	2

Sem.	Part	Code	Title of the Course	Hours	Credits
	V	20SLPEX01	**Service Learning Programme** - Extension JACEP	-	2*
	VI	20CS5MP01	Internship cum Mini Project - During Summer Holidays	-	1**
		20CS5SS01/ 20CS5SS02/ 20CS5SS03/ 20CS5SS04/ 20CS5SM01	Self Study Course: Software Testing / Green Computing/ XML and Web Services E-Commerce/ Self-Paced Learning - MOOC	-	2*
			Total	**30 +2**	**27+2*+2*+1****
VI	III	20CS6MC11	Computer Networks	4	4
		20CS6MC12	Data Warehousing and Mining	4	4
		20CS6MC13	Mobile Satellite Communications	4	4
		20CS6DE4A/ 20CS6DE4B/ 20CS6DE4C	IoT Fundamentals / Computational Intelligence/ Neural Networks	4	3
		20CS6MCP1	Project	10	9
	IV	20CS6GE02/ 20GE6NC02	NME - Animation - Lab (S -> A)/ NCC - Organization and Health Programme in NCC	2	2
	IV	20SE6CS04	**Skill Enhancement Compulsory Course (SECC) - 4:** Statistics for Computer Science	2	2
			Total	**30**	**2**
			Total for all Semesters	**180+2**	**140+6*+1****

*** Extra Credit - Self-Paced Learning – MOOCs, ** Departmental Extra Credit – Fully Internal Paper**

PART – I Tamil - இக்கால இலக்கியம்

பருவம்: ஒன்று **நேரம்: 6**

குறியீடு: 20GT1GS01 **புள்ளி: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	இக்கால இலக்கியக் கவிஞர்களைப் பற்றி அறிந்து கொள்வர்.	PSO - 1	ஆற்றல், புரிதல்
CO-2	இலக்கிய வரலாற்றை அறிந்து கொள்வர்	PSO - 1	புரிதல், பயன்படுத்துதல்
CO-3	வாழ்க்கையில் ஏற்படும் துன்பங்களை அகற்றி, வெற்றி பெறும் வழிமுறைகளைத் தெரிந்து கொள்வர்.	PSO - 5	ஆற்றல், மதிப்பீடு
CO-4	கட்டுரைகள் வழி பன்முகத் தகவல்களை அறிந்து கொள்வர்.	PSO - 1	பயன்படுத்துதல், அறிவு
CO-5	எழுத்து இலக்கணங்களை அறிந்து கொள்வர்.	PSO - 2	புரிதல், அறிவு

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

Semester: I			**PART - I Tamil - இக்கால இலக்கியம்**						**Hours: 6**
Code : 20GT1GS01									**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	5	4	2	4	5	3	4	5	5	3	2	3.83
CO - 2	4	4	5	4	3	5	5	3	2	5	2	3.83
CO - 3	4	5	4	2	5	3	4	5	5	2	3	3.83
CO - 4	5	3	5	2	4	5	3	2	4	5	4	3.83
CO - 5	5	5	4	5	4	3	2	4	5	3	2	3.83
Overall Means Score												**3.83**

Result: The Score of this Course is **3.83** (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

அலகு1: மரபுக் கவிதைகள்

1. பாரதியார்	-	நிலாவும் வான்மீனும் காற்றும் (மனத்தை வாழ்த்துதல்)
2. பாரதிதாசன்	-	வள்ளுவர் வழங்கிய முத்துக்கள்
3. கவிமணி தேசிக விநாயகம் பிள்ளை	-	உடல்நலம் பேணல்
4. கவியரசு கண்ணதாசன்	-	அனுபவமே கடவுள்
5. முடியரசன்	-	யார் கவிஞன்?

அலகு2: புதுக்கவிதை

1. ந. பிச்சமூர்த்தி	-	ஆத்தூரான் மூட்டை
2. நா. காமராசன்	-	காகிதப்பூக்கள்
3. அப்துல் ரகுமான்	-	ஆறாவது அறிவு
4. கவிஞர் பாலா	-	வானம் வசப்படும்
5. நெல்லை ஜெயந்தா	-	தொப்புள் கொடி

அலகு3: சிறுகதை

வெ. இறையன்பு	-	அழகோ அழகு

அலகு4: கட்டுரைத் தொகுப்பு

சிவசூரியன் இ.ஆ.ப.,	-	நிறைவாக வாழுங்கள்

அலகு5: இலக்கணம், இலக்கிய வரலாறு

1. இலக்கணம்: - எழுத்தும், சொல்லும்
   எழுத்து - முதலெழுத்து, சார்பெழுத்து
   சொல் - பெயர்ச்சொல், வினைச்சொல், இடைச்சொல், உரிச்சொல்
2. கி. இராஜா - தமிழ் இலக்கிய வரலாறு
   (இக்கால இலக்கியம், மரபுக்கவிதை, புதுக்கவிதை, உரைநடை தொடர்பான இலக்கிய வரலாறு)

பாடநூல்கள்:

1. தமிழ்த்துறை வெளியீடு - இக்கால இலக்கியம்
   ஜெயராஜ் அன்னபாக்கியம் மகளிர் தன்னாட்சிக் கல்லூரி
   பெரியகுளம்
2. வெ. இறையன்பு - அழகோ அழகு
   நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்,
   41-டீ சிட்கோ இண்டஸ்டிரியல் எஸ்டேட்,
   அம்பத்தூர், சென்னை – 98
   4ஆம் பதிப்பு – 2013.
3. சிவசூரியன் இ.ஆ.ப., - நிறைவாக வாழுங்கள்
   நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்,
   41-டீ சிட்கோ இண்டஸ்டிரியல் எஸ்டேட்,
   அம்பத்தூர், சென்னை – 98
   மு.பதிப்பு – 2017.
4. கி. இராஜா - தமிழ் இலக்கிய வரலாறு
   நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்,
   41-டீ சிட்கோ இண்டஸ்டிரியல் எஸ்டேட்,
   அம்பத்தூர், சென்னை – 98
   இரண்டாம் பதிப்பு – 2019.

ENGLISH FOR COMMUNICATION -I

Semester: I **Hours: 6**

Code : 20GE1GS01 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Develop a fair degree of competence in self-expression in both writing and speaking.	PSO-1	K, AP
CO - 2	Read and comprehend texts.	PSO-1, PSO-2	C, AP
CO - 3	Use academic resources.	PSO-3	AP
CO - 4	Engage in independent learning.	PSO-3	A, S, E
CO - 5	Obtain critical and analytical thinking.	PSO-5	AP, S, E

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

Semester : I											**Hours: 6**
Code : 20GE1GS01				**ENGLISH FOR COMMUNICATION -I**							**Credits: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of COs**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	5	3	4	5	4	4	3	5	5	5	4.27
CO-2	3	5	4	4	5	5	3	3	4	4	5	4.09
CO-3	3	5	4	3	3	3	3	4	3	3	5	3.54
CO-4	3	5	3	4	3	3	3	4	4	3	5	3.63
CO-5	5	5	4	3	5	5	3	5	4	5	5	4.45
Overall Mean Score												**3.99**

Result: The score for this course is **3.99** (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 **20 Hours**

1. Listening and Speaking
   a. Introducing self and others
   b. Listening for specific 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, encyclopedias, thesaurus
4. Grammar in Context

   Naming and Describing
   - Nouns and Pronouns
   - Adjectives

UNIT II **20 Hours**

1. Listening and Speaking
   a. Listening with a Purpose
   b. Effective Listening
   c. Tonal Variation
   d. Listening for Information
   e. Asking for Information
   f. Giving Information
2. Reading and Writing
   a. Strategies of Reading:

      Skimming and scanning
   b. Types of Reading:

      Extensive and Intensive Reading
   c. Reading a Prose Passage
   d. Reading a Poem
   e. Reading a Short Story

2. 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
3. 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
4. Grammar in Context

    Involving Action- I
    a. Verbs
    b. Concord

UNIT III **16 Hours**

1. Listening and Speaking
    a. Giving and following instructions
    b. Asking for and giving directions
    c. Continuing discussions with connecting ideas

    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

    Grammar in Context

    Involving Action- II

    - Verbal- Gerund, Participle, Infinitive
    - Modals

UNIT IV **16 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

   Grammar in Context

   Tense

   - Present
   - Past
   - Future

UNIT V **18 Hours**

1. Listening and Speaking

   a. Participating in a Group discussion

2. Reading and writing

   a. Reading diagrammatic information - interpretations, maps, graphs and pie charts

   b. Writing short essays using the language of comparison and contrast

3. Grammar in Context: Voice (Show the relationship between Tense and Voice)

COURSE BOOK

- Communicative English (For Students of Arts and Science Colleges) Tamilnadu State Council for Higher Education (TANSCHE)

ENGLISH FOR COMMUNICATION I - 20GE1GS01

QUESTION PATTERN

Time: 3 Hours **Marks: 75**

PART - A

1. Match the expressions (Introduce self/ others) (Unit I) 5 × 1 = 5
2. Interpret the given Diagrammatic chart 1 × 5 = 5
3. Write a day's happenings as journal entry 1 × 5 = 5
4. Write a narrative essay of two to three paragraphs 1 × 5 = 5

   (From Unit III)

PART - B

Answer the following 5 × 5 = 25

5. Attempt a group discussion on the given topic

   (From Unit - V)

6. Write a conversation by giving opinions on the given topic

   (From Unit -IV)

7. Read the following passage and identify the point of view and perspective of the writer.

   (From Unit -III)

8. Take Notes for the given passage.

   (From Unit - IV)

9. Write any ONE paragraph on the following topics

   (From Unit - II)

PART - C

10. Identify the verbs in proverbs and terms in new media. 10 × 1 = 10

    (From Unit- II)

11. Fill up the blanks by using appropriate Noun & Pronoun/Adjective/ Verbs/ Concord/Gerund/ Participle/ Infinitive/ Modals/ Voice/ Tenses (all Units)

    20 × 1 = 20

PROGRAMMING IN C

Semester: I **Hours: 5**

Code : 20CS1MC01 **Credits: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Gain the fundamental knowledge of C programming language.	PSO-1	K
CO-2	Apply decision making, branching and looping in C.	PSO-2	AP
CO-3	Develop deep knowledge in arrays, strings and user defined functions.	PSO-3	AP
CO-4	Compare and contrast structures and unions.	PSO-2	AN
CO-5	Analyze pointers and file handling concepts in C.	PSO-1	AN

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

Semester: I				**PROGRAMMING IN C**							**Hours: 5**
Code : 20CS1MC01											**Credits: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	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	3	3	3.91
CO-4	5	4	5	4	3	3	5	5	5	3	3	4.09
CO-5	5	4	5	4	3	3	5	5	5	3	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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I

Overview of C: History of C – Importance of C –Basic Structure of C Programs – **Constants, Variables and Data types:**Introduction- Character Set - C Tokens – Keywords and Identifiers –Constants- Variables- Data types – Declaration of Variables –Declaration of Storage Class- Assigning Values to Variables- Defining Symbolic Constants – Declaring a Variable as Constant – Declaring a Variable as Volatile -**Operators and Expressions:** Introduction – Arithmetic Operators – Relational Operators- Logical Operators- Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of expressions – Precedence of Arithmetic Operators. **Managing Input and Output Operations:** Reading a Character – writing a character – Formatted Input – Formatted Output**. (15 Hours)**

UNIT II

Decision Making and Branching – Introduction- Decision Making with IF statement – Simple IF statement – The IF …ELSE Statement – Nesting of IF…ELSE statements- The ELSE… IF Ladder – The Switch Statement –The?: Operator –The Goto Statement –**Decision Making and Looping** –Introduction-The WHILE Statement – The DO Statement – The FOR Statement – Jumps in Loops. **(15 Hours)**

UNIT III

Arrays: Introduction – One dimensional Arrays-declaration of One-dimensional Arrays-Initialization of One-dimensional Arrays- Two dimensional Arrays - Initializing Two dimensional Arrays – Multi dimensional Arrays –Dynamic Arrays – **Character Arrays and Strings:** Introduction – Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to screen –Arithmetic Operations on characters – Putting Strings Together – Comparison of Two Strings - String Handling Functions. **User Defined Functions:** Introduction – Need for user defined functions- a multi-function program- elements of user defined functions – return values and the types – function calls – Function Declaration- Categories of Functions – Nesting of Functions – Recursion – passing array to functions. **(15 Hours)**

UNIT IV

Structures and Unions: Introduction- Defining a structure – Declaring Structure Variables – Accessing Structure Members-Structure Initialization – Copying and Comparing Structure Variables - Operations on Individual Members - Arrays of

Structures - Arrays Within Structures- Structures within Structures – Structures and Functions –Unions – Size of Structures – Bit fields. **(15 Hours)**

UNIT V

Pointers: Introduction – Understanding Pointers - Accessing the Address of a Variable – Declaring Pointer Variables – Initialization of Pointer Variables - Accessing a Variable Through its Pointer – Chain of Pointers –pointer Expressions -**File Management in C:**Introduction – Defining and Opening a File – Closing a File – Input/Output Operations on Files – Error Handling during I/O Operations – Random Access to files – Command line arguments. **(15 Hours)**

BOOK FOR STUDY

1. **"Programming in ANSI C",** E. Balagurusamy, Tata McGraw Hill Private Limited, New Delhi, Eighth Edition, 2019.

UNIT I : Chapters 2.1, 2.2, 2.8, 3, 4,5

UNIT II : Chapters 6, 7

UNIT III : Chapters 8, 9, 10

UNIT IV : Chapter 11

UNIT V : Chapters 12, 13

BOOKS FOR REFERENCE

1. "**The CProgramming Language"**–Brian W.Kernighan, Dennis M.Ritchie, Second Edition, Prentice Hall, 2015
2. "**Let us C**" –YashavantKanethkar, Sixteenth Edition, BPB Publishers, 2017.

PROGRAMMING IN C - LAB

Semester: I **Hours: 4**

Code : 20CS1CP01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquirethe basic concepts of C to solve simple problems.	PSO-1	K
CO-2	Design small applications using arrays and functions in C.	PSO-1	AP
CO-3	Implement Structure and pointers in C programs for dealing with multiple data.	PSO-2	AP
CO-4	Working on strings with and without string handling functions	PSO-2	C
CO-5	Develop applications using files and pointer functions in C.	PSO-2, 5	C

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

Semester: I				**PROGRAMMING IN C - LAB**							**Hours: 4**
Code : 20CS1CP01											**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	5	5	4	3	2	3	5	4	3	3	4	3.73
CO-2	5	4	4	2	2	3	5	4	3	3	4	3.55
CO-3	4	5	4	2	3	3	4	5	4	3	4	3.73
CO-4	4	4	4	2	3	3	4	5	4	2	4	3.55
CO-5	4	4	4	2	3	3	4	4	3	2	4	3.36
Overall Mean Score												**3.58**

Result: The score for this course is **3.58** (High Relationship)

Note:

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

Values Scaling:

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

1. Simple Programs
2. Programs for Number Checking
3. Programs for Number Generation
4. Programsusing One-Dimensional Array
5. Programsusing Two-Dimensional Array
6. Programsusing Function
7. Program using Recursive function
8. Library Maintenance using Structure
9. String Manipulation using Pointers without Predefined Function
10. Program using Files

MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE

Semester: I **Hours: 5**

Code : 20CS1AC01 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Formulate logic expressions for a variety of applications.	PSO-1	K
CO-2	Differentiate atomic and compound statements formulae.	PSO-2	U
CO-3	Explain the basic concepts of graph theory.	PSO-1	U
CO-4	Identity, formulate and solve computer science problems into mathematics logical statement.	PSO-3	AP
CO-5	Construct the maximin-minimax principal to find the better solutions.	PSO-5	C

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

Semester: I				MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE								Hours: 5
Code : 20CS1AC01												Credits: 4
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO-1	5	4	4	3	2	3	4	4	3	2	2	3.27
CO-2	5	4	4	3	2	3	4	4	3	2	2	3.27
CO-3	5	4	4	3	3	3	4	4	4	3	3	3.64
CO-4	5	4	4	3	3	3	4	4	4	3	3	3.64
CO-5	5	4	4	3	3	3	4	4	3	3	3	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

Matrix Algebra: Introduction – Matrix operations – Inverse of a square matrix – Elementary operations and Rank of a matrix – Simultaneous Equations – Eigen values and Eigen vectors. **(15 Hours)**

UNIT II

Logic: Introduction – TF statements – Connectives – Atomic and compound statements – Well found formula – Truth table of a formula – Tautology – Tautological implication and equivalence of formulae. **(15 Hours)**

UNIT III

Basic definitions – Graph – Adjacent – Multi graph – Complete graph –Null graph –Bi graph – Complete bi graph - Degrees – Isolated point – Regular graph – Cubic graph - Sub graphs – Spanning sub graph - Isomorphism – Automorphism. **(15 Hours)**

UNIT IV

Walk – Initial point – Terminal point – Trail – Path - Closed – Cycle - Triangle – Connected – Disconnected (Theorem 4.4 to Theorem 4.7) – Connectivity – Line connectivity – n-connected - n-line connected. **(15 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. **(15 Hours)**

BOOKS FOR STUDY

1. **"Discrete Mathematics",** Dr. M.K Venkataraman, Dr. N. Sridharan, Dr. Chandra Sekaran, The National Publishing Company, 2000.

   Unit I: Chapter VI - (1 – 7)

   Unit II: Chapter IX - (1 – 8)

2. **"Invitation to Graph Theory"** S.Arumugam, S. Ramachandran, Scitech Publications (India) PVT. Ltd, Chennai - June 2001.

   Unit III: Chapter II -(2.1, 2.2, 2.3, 2.4)

   Unit IV: Chapter IV - (4.1,4.2,4.4)

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

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 International Edition, 1985.

PROFESSIONAL ENGLISH

Semester: I **Hours: 2**

Code : 20CS1AE01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Learn to use LSRW skills and advanced communication skills in the technical field of their study.	PSO-1	K
CO-2	Identify a range of specialist ICT vocabulary and use it accurately in spoken and written work.	PSO-1,2	K
CO-3	Understand how English is used in Computer Science field so as to imbibe the spirit of using the standard language for communication.	PSO-1,2	AP
CO-4	Demonstrate subject related matters throughwritten exercises and discussion.	PSO-2	AP
CO-5	Use specific vocabulary, explanations, definitions and expressions of technical scenario.	PSO-4,5	S

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

Semester: I				**PROFESSIONAL ENGLISH**							**Hours: 2**
Code : 20CS1AE01											**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	5	5	3	3	4	2	5	5	3	2	2	3.55
CO-2	5	5	3	3	4	3	4	5	3	3	2	3.64
CO-3	5	3	4	2	3	2	5	5	3	2	2	3.27
CO-4	4	4	4	2	4	2	4	5	2	2	2	3.18
CO-5	4	3	3	2	4	3	4	5	3	3	2	3.27
Overall Mean Score												**3.38**

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

Note:

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

Values Scaling:

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

UNIT I	**Topic / Context**	:	**Hardware / Software:** Hard drives and storage devices, Input and Output Devices, Operating systems, Configuration and installation of computers, Laptops and other mobile devices,	**6 Hours**
	Grammar /Function	:	Describe the functions of a computer hardware Present simple / present continuous (active and passive forms) Countable and uncountable nouns Comparatives Defining relative clauses Imperative forms& givinginstructions Perfect tenses (active and passive form)	
	Speaking/ Listening	:	Listen for specific information/ key vocabulary, provide explanations and Contrast & compare Explain functions of specialist verbs and nouns	
	Reading/ Writing	:	Reading for specific information Discard incorrect information Online activities and tests Create table (Word document) with information on Summarize main strengths and weaknesses of different types of operating systems	
	Teaching and Learning Methods		Vocabulary focus group presentation andlanguage focus Examination of text 'how to install a computer' **Supporting video:** Matching pairs /definitions Cloze exercise Students conduct class / small group survey of computing needs Identify laptop best suited to group needs Present findings and justify choice **BBC websites:** • http://www.bbc.co.uk/schools/gcsebitesize/ict/hardware/1datastoragerev1.shtml • http://www.bbc.co.uk/schools/gcsebitesize/ict/hardware/0inputandoutputdevicesact.shtml **See example teaching plans:** 1. What is a computer? 2. How to install a software in a computer **3.** Buying a laptop	
	Resources	:	**BBC Websites:** 1. Vocabulary glossary Projector Whole class access to internet 2. Whiteboard /Projector 3. Whole class access to internet 4. Laptop/s Internet access 5. Whiteboard / projector 6. IT magazines (e.g. Which? Magazine) • www.buzzle.com/articles/computer-	

			networking-basics.html • http://www.homepcbuilder.com/ • http://www.youtube.com/watch?v=f1X2Wpwl4dg **See example resources:** 1. What is a computer? 2. Installing a computer **3.** Laptops, student questions	
	Additional Information and Web Links	:	BBC GCSE ICT website: revision, activities, tests • http://www.bbc.co.uk/schools/gcsebitesize/ict/ • http://www.explainthatstuff.com/howcomputernetworkswork.htmlhttp://www.bbc.co.uk/schools/gcsebitesize/ict/ • http://www.which.co.uk/about-which/what-we-offer/magazines-and-books/which-computing/	
UNIT II	**Topic /Context**	:	**HARDWARE / SOFTWARE:** Printers, scanners, video projectors	**6 Hours**
	Grammar / Function	:	Perfect tenses (active and Perfect tenses passive form) Asking for clarifications Gerunds and infinitives: Making, accepting, refusing suggestions Persuasive adjectives Use and non- use of articles: a / an / the Quantifiers with countable/ uncountable nouns	
	Speaking / Listening	:	Ask questions Justify Contrast and compare Summarize	
	Reading / Writing	:	• How to conduct / participate in a group discussion • Eg.https://ctb.ku.edu/en/table-of-contents/leadership/group-facilitation/group-discussions/main • https://www.softwaretestinghelp.com/how-to-crack-the-gd/ • Presentation of a Project before higher officials • Presenting a report of a customer meeting to the Project Leader	
	Teaching and Learning Methods		Use examples of realia – newspaper adverts, online advertising to demonstrate the format, structure and typical language style used in advertising Whole group focus: video: complain/ complaint as prompt paired role play writing letter of complaint **See sample teaching plan: Printers and scanners**	
	Resources	:	http://www. youtube.com/watch?v=ru53eMo0i2c Examples of adverts: newspaper, lettersof	

			complaint **See example resources:** 1. Printers, scanners and video projectors **2.** Letter/ vocabulary of complaint	
	Additional Information and Web Links	:	http://www.explainthatstuff.com/inkjetprinters.html http://www.explainthatstuff.com/scanners.html http://www. explainthatstuff.com/inkjetprinters.html http://www.explainthatstuff.com/scanners.html	
UNIT III	**Topic /Context**	:	**INTERNET AND THE WEB:** Protection and safety online, Social and professional networks, Basic commands, Use of acronyms HTML / HTTP, Linking, Browsers	**6 Hours**
	Grammar / Function	:	Modal Verbs for obligation, advice and possibility Future tenses; Predictions Giving advice & giving warnings Degrees of adjectives Compound nouns (Web portal, search engine, clipboard) Compound adjectives: Noun +present participle (Space – saving PC) Noun + adjective (A hands-free device A stand-alone computer)	
	Speaking/ Listening	:	• https://www.youtube.com/watch?v=WM1MBAj1yAU • https://www.youtube.com/watch?v=JEVurb1uVFA • https://www.youtube.com/watch?v=qI3UXTXHsus	
	Reading/ Writing	:	• https://www.oki.com/en/otr/2003/n194/pdf/otr-194-R02.pdf • http://j387mediahistory.weebly.com/uploads/6/4/2/2/6422481/printing_history.pdf	
	Teaching and Learning Methods		**See example Teaching Plan**: 'Internet vocabulary' **Online tutorials:** • http://www.html.net/http://www.w3schools.com/html/ • http://www.bbc.co.uk/webwise/courses/internet basics/lessons/internet-basics Guide students through the appropriate online exercises and activities. Whole class test and preparations for final assessments.	
	Resources	:	Reading booklet: Rough Guide to Staying Safe Online Prepare class questionnaire template http://www.webmonkey.com/ **See example resources:** 1. 'Internet' 2. 'Internet Cloze exercise' 3. HTML worksheet / create a simple webpage 4. 'Student worksheet: web browsers'	
	Additional	:	• http://www.explainthatstuff.com/internet.html	

	Information and Web Links		• http://www.explainthatstuff.com/howthewebworks.html • http://www.explainthatstuff.com/internet.html • http://www.explainthatstuff.com/internet.html • http://en.wikipedia.org/wiki/Web_browser	
UNIT IV	**Topic /Context**	:	**MULTIMEDIA:** Human communication and speech, Video conferencing **CREATIVE MEDIA:** Working in the creative industries	**6 Hours**
	Grammar / Function	:	Adjectives Relative pronoun + verb Relative clauses (defining and non-defining) Modal verb 'should' Verbs + adverbs in instructions (look + carefully)	
	Speaking/ Listening	:	http://www.digitalmediajobs.com/content2/Audio-Interviews-22.htm Listen to 2 expert interviews on working in Search Engine Industry, advice for job interviews: 16 & 12 minutes Identify key elements of advice / instruction Use appropriate questions and answers for job interviews	
	Reading/Writing	:	Identify most common prefixes used in ICT terminology and provide definitions	
	Teaching and Learning Methods		**Group focus:**Overview of multimedia products, industry and employmentopportunities. MM product in detail and produce summary of functions / operating options e.g video conferencing Discussion of topic: what is Video conferencing? Present video Whole group Key Word bingo	
	Resources	:	**SeeBBC Bitesize:** • Videoconferencing: http://www.youtube.com/tch?v=5I8j_1Q37Xk • http://www.youtube.com/watch?v=pECR2gGL9sg • **Etiquette:**http://www.youtube.com/watch?v=Xq1AfDvg6qM&feature=related • **Humour:**http://www.youtube.com/watch?v=Lc3k1aXGS78&feature=related **See example Resources:** 1. Virtual Communication 2. Key Word Bingo	
	Additional Information and	:	Roughguidetomultimedia:(2000) http://www.webproject.org/pdf/rguide42.pd	

	Web Links		f • **BBCBitesize:** http://www.bbc.co.uk/schools/gcsebitesize/dida/multimedia/productsrev1.shtml • http://www.youtube.com/watch?v=pECR2gGL9sg • http://www.youtube.com/watch?v=9xLSJMoZVcE&feature=related	
UNIT V	**Topic /Context**	:	**VIRTUAL COMMUN ICATION:** Social websites **TYPES OF SOFTWARE PACKAGES:** Key vocabulary, Using documents	**6 Hours**
	Grammar / Function	:	Common prefixes Trans- en- Intra- up- Extra- de- Tele- un- Super- e- Semi- cyber- Common commands: (Open / save/ save as / insert / cut / copy / paste) Conditionals (zero) Linking words for connecting ideas formally; addition and contrasts	
	Speaking/ Listening	:	**Asking questions:** e.g. 1. How do we communicate? 2. What is the future of communication? Explain different models of documents structure to peers Agreeing and disagreeing Instructions: Instruct peers on processes need to e.g. create table, spreadsheet, insert graphics to a Word document Justifications	
	Reading/Writing	:	Summarize the most popular social websites used by the group Identify and contrast the benefit and disadvantages of social networking Read and understand software text online: BBC website Project writing – Informative document on creating data structure with multimedia instruments	
	Teaching and Learning Methods		**See example Resources:** common prefixes in internet use Facebook, Twitter, LinkedIn, MySpace, BBM, Google plus, Bebo, Flickr **Whole class:** explore and identify different software packages and functions **Small group activity:** 1. Explore functions of 1 software package. Report back. 2. Design and present information about particular software package. Review and revise software packages: Vocabulary test: True / false	
	Resources	:	**On screen examples** • http://www.youtube.com/watch?v=Ixl_i2yOEHc • Humour: Dangers of Virtual Communication • http://www.bbc.co.uk/schools/gcsebitesize/ict/software/	

			• http://www.bbc.co.uk/schools/gcsebitesize/ict/software/wordprocessing_act.shtml See example resources: Software packages Functional Skills	
	Additional Information and Web Links	:	Students' own online social networking sites • http://www.bbc.co.uk/schools/gcsebitesize/ict/software/wordprocessing_act.shtml • http://www.explainthatstuff.com/voicerecognition.htm	
	Topic /Context	:	Assessment / project completion	

BOOK FOR STUDY:

"Vocational English for ICT", British Council, Albania, United Kingdom, May 2012.

UNIT I **:** Chapters : 2, 3

UNIT II **:** Chapter : 4

UNIT III **:** Chapters : 5, 9

UNIT IV **:** Chapter : 6

UNIT V **:** Chapters : 7, 8

BOOKS FOR REFERENCE:

1. **"Computer English for Everyday Use"**BlankaBátri Katalin Fazekas, DI-PRESS, 2003.
2. **"Technical English Vocabulary and Grammar"**Nick Brieger and Alison Pohl, Summertown Publishing.

PROFESSIONAL ENGLISH

Semester: I **Hours: 2**

Code : 20CS1AE01 **Credits: 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, PSO-4	C,AP, S
CO - 2	Use language for speaking with confidence in an intelligible and acceptable manner	PSO-1, PSO-4, PSO-3,PSO-5	C, AP, E
CO - 3	Read independently unfamiliar texts with comprehension	PSO-2, PSO-3, PSO-5	K,C,AP,E
CO - 4	Understand the importance of reading for life and writing in academic life.	PSO-1, PSO-3, PSO-4, PSO-5	C,AP, E
CO - 5	Write simple sentences without committing error of spelling or grammar	PSO-4	C,E

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

Semester : I				**PROFESSIONAL ENGLISH**							**Hours: 2**
Code : 20CS1AE01											**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	4	4	4	4	4	4	4	3	4	4	4	3.90
CO-2	3	4	4	4	4	4	4	3	4	4	4	3.81
CO-3	4	3	3	3	4	4	4	4	3	3	4	3.63
CO-4	3	4	4	3	4	4	4	3	3	3	4	3.54
CO-5	3	4	3	3	3	3	3	4	4	4	4	3.45
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 = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

NB: All four skills are taught based on texts/passages.

UNIT I: COMMUNICATION

Listening: Listening to audio text and answering questions - Listening to Instructions

Speaking: Pair work and small group work.

Reading: Comprehension passages –Differentiate between facts and opinion

Writing: Developing a story with pictures.

Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT II: DESCRIPTION

Listening: Listening to process description.-Drawing a flow chart.

Speaking: Role play (formal context)

Reading: Skimming/Scanning-

Reading passages on products, equipment and gadgets.

Writing: Process Description –Compare and Contrast Paragraph-Sentence Definition and Extended definition-Free Writing.

Vocabulary: Register specific -Incorporated into the LSRW tasks.

UNIT II: NEGOTIATION STRATEGIES

Listening: Listening to interviews of specialists / Inventors in fields (Subject specific)

Speaking: Brainstorming.(Mind mapping). Small group discussions (Subject- Specific)

Reading: Longer Reading text.

Writing: Essay Writing (250 words)

Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT IV: PRESENTATION SKILLS

Listening: Listening to lectures.

Speaking: Short talks.

Reading: Reading Comprehension passages

Writing: Writing Recommendations Interpreting Visuals inputs

Vocabulary: Register specific -Incorporated into the LSRW tasks

UNIT V: CRITICAL THINKING SKILLS

Listening: Listening comprehension- Listening for information.

Speaking: Making presentations (with PPT- practice).

Reading: Comprehension passages –Note making. Comprehension: Motivational article on Professional Competence, Professional Ethics and Life Skills)

Writing: Problem and Solution essay– Creative writing –Summary writing

Vocabulary: Register specific - Incorporated into the LSRW tasks

COMPUTER FUNDAMENTALS

Semester: I **Hours: 2**

Code : 20SE1CE1A **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Understand the input and output devices of Computers and how it works and recognize the basic terminology used in computer programming.	PSO-1	K
CO-2	Comprehend the basics Knowledge on handling operating system.	PSO-1,2	C
CO-3	Understand the basics of Word processing.	PSO-1,2	U
CO-4	Acquire basic knowledge on Internet, Applications of Internet and the World Wide Web.	PSO-5	K
CO-5	Present the content using presentation software	PSO-4	C

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

Semester: I				**COMPUTER FUNDAMENTALS**							**Hours: 2**
Code : 20SE1CE1A											**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	5	5	5	3	4	2	5	5	3	3	2	3.82
CO-2	5	4	5	3	3	3	5	5	4	3	2	3.82
CO-3	5	4	4	2	3	2	5	5	3	3	3	3.55
CO-4	5	4	5	2	3	2	5	5	4	3	3	3.73
CO-5	4	3	4	2	3	3	4	5	3	3	3	3.36
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 = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

UNITI

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, Sixth Edition, Prentice-Hall of India Private Limited. 2015

இடைக்கால இலக்கியமும் நாவலும்

பருவம்: இரண்டு **நேரம்: 6**

குறியீடு: 20GT2GS02 **புள்ளி: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	சைவ, வைணவ அடியார்களின் பக்தியைப் பற்றி அறிந்து கொள்வர்.	PSO - 4	புரிதல்
CO-2	அடியார்களின் வழி இறைவனின் அருள் தன்மையைப் புரிந்து கொள்வர்.	PSO - 4	அறிவு
CO-3	செய்யுள் எழுதும் முறையைக் கற்றுக் கொள்வர்.	PSO - 1	புரிதல்
CO-4	வெற்றிச் சிறப்பைப் போற்றும் முறையைத் தெரிந்து கொள்வர்.	PSO - 3	அறிவு
CO-5	செய்யுள் வழி உரைநடையையும், புதின மரபையும் கற்றுக் கொள்வர்.	PSO - 1	அறிவு, புரிதல்

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

Semester: II			இடைக்கால இலக்கியமும் நாவலும்								**Hours: 6**
Code : 20GT2GS02											**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	5	4	2	4	5	3	4	5	5	4	3	4.25
CO - 2	4	4	5	4	3	5	5	3	2	5	3	4.19
CO - 3	4	5	4	2	5	3	4	5	5	2	3	3.83
CO - 4	5	3	5	2	4	5	3	2	4	5	4	3.83
CO - 5	5	5	4	5	4	3	2	4	5	3	2	3.83
Overall Means Score												**3.98**

Result: The Score of this Course is **3.98** (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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

அலகு1: சைவம்

1. திருஞானசம்பந்தர் - திரு ஆலவாய் - 2 பாடல்கள்
    1. மந்திரமாவது நீறு...
    2. வேத்திலுள்ளது நீறு ...
2. திருநாவுக்கரசர் - தேவாரம் - 2 பாடல்கள்
    1. நாமார்க்கும் குடியல்லோம்...
    2. பாலனாய்க் கழிந்த ...
3. சுந்தரர் - தேவாரம் - 2 பாடல்கள்
    1. ஊனாய் உயிர் ஆனாய் ...
    2. மழுவாள் வலன் ஏந்தி மன்ற ...
4. மாணிக்கவாசகர் - சிவபுராணம் 15 வரிகள்

    நமச்சியவாய வாழ்க முதல்... சீரார் பெருந்துறை நம்தேவன் அடி போற்றி வரை

அலகு2: வைணவம்:

1. பேயாழ்வார் - திருக்கண்டேன்...
2. பூதத்தாழ்வார் - அன்பே தகளியா...
3. பொய்கையாழ்வார் - வையம் தகளியா...
4. ஆண்டாள் - திருப்பாவை முதல் 10 பாடல்கள்

அலகு3: சிற்றிலக்கியங்கள்

1. கலிங்கத்துப்பரணி - இந்திர சாலம்
2. நந்திக் கலம்பகம்
    1. மயில் கண்டால் மயிலுக்கே வருந்தியாங்கே - 25வது பாடல்
    2. ஓடரிக்கண் மடநல்லீர் ஆடாமோ ஊசல் - 29வது பாடல்
    3. அறம்பெருகும் தனிச்செங்கோன் மாயன் தொண்டை – 60வது பாடல்

அலகு4: குறுநாவல்

ரட்டை வால் குருவி – யாழ் எஸ். ராகவன்

அலகு5:

இலக்கணம்: யாப்பின் உறுப்புக்கள்

இலக்கிய வரலாறு - பக்தி இலக்கியம், சிற்றிலக்கியம் தொடர்பான பகுதிகள்
நாவலின் தோற்றமும் வளர்ச்சியும்.

பாடநூல்கள்:

1. தமிழ்த்துறை வெளியீடு - இடைக்கால இலக்கியம்,
   ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி,
   பெரியகுளம்
2. எம்.ஆர்.அடைக்கலசாமி - தமிழ் இலக்கிய வரலாறு, ராசி பதிப்பகம்,
   சென்னை - 73, 41ஆம் பதிப்பு.
3. யாழ் எஸ். ராகவன் - ரட்டை வால் குருவி,
   நியூசெஞ்சுரி புக் ஹவுஸ் (பி) லிமிடெட், சென்னை.
   மு.ப. 2020

ENGLISH FOR COMMUNICATION - II

Semester: II **Hours: 6**

Code : 20GE2GS02 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO -1	Develop a fair degree of competence in self-expression in both writing and speaking.	PSO-1, PSO-3, PSO-4	C, S
CO - 2	Read and comprehend texts.	PSO-2, PSO-4, PSO-5	K, AP
CO - 3	Use academic resources.	PSO-1, PSO-2, PSO-5	AP, A
CO - 4	Engage in independent learning.	PSO-1, PSO-4, PSO-5	C
CO - 5	Obtain critical and analytical thinking.	PSO-1, PSO-5	C, AP, A

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

Semester : II				**ENGLISH FOR COMMUNICATION - II**							**Hours: 6**
Code : 20GE2GS02											**Credits: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of COs**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	5	3	3	3	3	3	4	5	3	4	3.54
CO-2	4	5	4	3	3	4	3	4	4	3	5	3.81
CO-3	4	4	3	3	5	4	3	4	3	3	5	3.72
CO-4	3	4	3	4	3	4	3	3	5	3	5	3.63
CO-5	4	4	3	3	4	4	3	4	5	4	5	3.90
Overall Mean Score												**3.72**

Result: The score for this course is **3.72** (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 **18 Hours**

1. Speaking and listening

a. Participating in group discussions

Reading and writing

a. Reading short fictional pieces
    i. Reading aloud
    ii. Identifying mood, tone, point of view
    iii. Working with diction
b. Writing short argumentative essays of two to three paragraphs
c. Writing a resume

Grammar in Context

a. Subject Verb Agreement
b. Active and passive voice

UNIT II **18 Hours**

1. Speaking and Listening
    a. Making short presentations
    b. Interactions during and after the presentations

Reading and Writing

a. Writing opinion pieces (could be on travel, food, film / book reviews or on any contemporary topic)
b. Writing a cover letter
c. Reading poetry
    i. Reading aloud: (Intonation and Voice Modulation)
    ii. Identifying and using simile, metaphor, personification etc.

Grammar in Context

a. Idioms and phrasal verbs
b. Second and third conditional

UNIT III **18 Hours**

1. Speaking and Listening
    a. Note making

Reading and writing

a. Writing emails of complaint
b. Reading longer fictional / non-fictional pieces in which all the reading skills can be brought into play
c. Preparing outlines for short assignments

3. Grammar in Context
    a. Working with clauses
    b. Direct and indirect speech

UNIT IV **18 Hours**

1. Speaking and Listening
   a. Listening to understand different accents

   Reading and Writing
   a. Reading visual texts - advertisements
   b. Preparing first drafts of short assignments
   c. Writing cover letter

UNIT V **18 Hours**

1. Speaking and listening
   a. Taking leave

   Reading and Writing
   a. Peer-reviewing
   b. Preparing final draft using peer review comments
   c. Writing letters of application
   d. Readers' Theatre: (Reading aloud a given script - Scripts by Aaron Shepherd available on the internet)
   e. Dramatizing everyday situations/social issues through skits. (writing scripts and performing)

COURSE BOOK:

- Communicative English (For Students of Arts and Science Colleges) Tamilnadu State Council for Higher Education (TANSCHE)

ENGLISH FOR COMMUNICATION – II - 20GE2GS02

Question Pattern

Time: 3 Hours **Marks: 75**

1.	Fill in the blanks with suitable answers	20 × 1 = 20
2.	Write a resume for job application (unit- I)	1 × 5 = 5
3.	Writing on contemporary topics (unit-II)	1 × 5 = 5
4.	Letter Writing (unit - II, V)	1 × 10 = 10
5.	Business Letter/ email Writing (unit-III)	1 × 10 = 10
6.	Note Making (unit- III)	1 × 10 = 10
7.	Writing short essays (unit- I)	1 × 10 = 10
8.	Writing Advertisement (unit-IV)	1 × 5 = 5

OBJECT ORIENTED PROGRAMMING WITH C++

Semester: II **Hours: 4**

Code : 20CS2MC02 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Outline the basic concept of object oriented programming.	PSO-1	K
CO-2	Discuss class, object, constructor and destructor.	PSO-2	U
CO-3	Predict the role of inheritance in building reusable code.	PSO-2	U
CO-4	Analyze Polymorphism and file handling in C++.	PSO-1	AN
CO-5	Handle the errors in a program using exception handling	PSO-2	AP

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

Semester: II				**OBJECT ORIENTED PROGRAMMING WITH C++**							**Hours: 4**
Code : 20CS2MC02											**Credits: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	4	4	3	3	3	5	5	4	3	2	3.73
CO-2	5	3	5	3	3	3	5	5	4	3	2	3.73
CO-3	5	3	4	3	3	2	5	4	4	3	3	3.55
CO-4	5	4	5	3	3	2	5	5	4	3	3	3.82
CO-5	4	4	4	3	3	3	5	5	4	3	3	3.73
Overall Mean Score												**3.71**

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

Note:

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

Values Scaling:

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

UNIT I

Principles of ObjectOriented Programming: A look at Procedure OrientedProgramming - 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 andConstants - Basic Data types- User Defined Data Types - Storage Classes - Derived Data Types - Symbolic Constants - Type Compatibility- Declaration of Variables - Dynamic Initialization of Variable - Reference Variable - Operator 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 byReference - Return by Reference - Inline Functions- Default Arguments - Const Arguments - Recursion - Function Overloading - Friend & Virtual Function - Math Library Functions. **Classes and Objects:** Specifying a Class - Defining Member Functions - 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 – ParameterizedConstructors - Multiple Constructors in Class - Constructors with Default Arguments - Dynamic Initialization of Objects - Copy Constructor - Dynamic Constructor - Constructing Two-Dimensional Arrays - Const Objects - Destructors. **Operator Overloading and Type Conversions**: Defining Operator Overloading - Overloading Unary & Binary Operators - Overloading Binary Operators using Friends - Manipulation of Strings using operators - Rules for overloading operators - Type conversions. **Inheritance**: **Extending Classes:** Single Inheritance - Making a private member Inheritable - Multiple Inheritance - Multilevel 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 ConsoleI/O Operations:** C++ Streams - C++ Stream Classes - Unformatted I/OOperations - Formatted Console Operations - Managing Output with Manipulators. **Working with Files:** Classes for File stream operations - Opening and Closing a file - Detecting End-of-File - More about Open(): File Modes - File Pointers and their Manipulations - Sequential Input and Output Operations - Updating a File: Random Access - Error Handling during File Operations - Command Line Arguments.

(12 Hours)

UNIT V

Templates: Introduction - Class Templates - Class Templates with MultipleParameters - 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. **ManipulatingStrings:** 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, 7th Edition, 2017.

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

BOOKS FOR REFERENCE:

1. **"A Tour ofC++"**, D. BJarne Stroustrup, Second Edition, Kindle Edition, 2018.

2. "**C++ Programming: An Object Oriented Approach**", Behrouz A. Forouzon, Richard F. Gilberg, 1st Edition, Kindle Edition, 2019.

OBJECT ORIENTED PROGRAMMING- LAB

Semester: II **Hours: 3**

Code : 20CS2CP02 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Apply object-oriented programming features to program design and implementation.	PSO-1	AP
CO-2	Solve different programming concepts with functions, classes, to overload operators.	PSO-2	AP
CO-3	Execute inheritance and Pointers using classes and templates.	PSO-3	AP
CO-4	Develop programs using Exception handling and file handling mechanisms.	PSO-2	C
CO-5	Apply appropriate advanced object-oriented programming concepts in problem solving.	PSO-3,5	AP

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

Semester: II				**OBJECT ORIENTED PROGRAMMING- LAB**							**Hours: 3**
Code : 20CS2CP02											**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	5	5	4	4	5	2	5	5	4	2	2	3.91
CO-2	5	5	5	3	4	3	4	5	4	3	2	3.91
CO-3	5	4	4	3	4	2	5	5	3	2	2	3.55
CO-4	5	4	5	3	4	2	4	5	4	2	2	3.64
CO-5	5	4	4	3	4	3	4	5	4	3	2	3.73
Overall Mean Score												**3.75**

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

Note:

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

Values Scaling:

Mean Score of Cos = 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 program with classes and objects.
3. Program using friend functions to calculate the total salary of the family.
4. Program using inline function.
5. Demonstration of Operator overloading & Function Overloading.
6. Program using constructor, constructor overloading and destructor.
7. Apply real time problems using different types of inheritance.
    i. Student Details – Single Inheritance
    ii. Employee Details – Multiple Inheritance
    iii. EB Bill Calculation – Multilevel Inheritance
    iv. Railway Reservation Details – Hierarchical Inheritance
8. CIA Mark Preparation Program using Inheritance with virtual base class.
9. Program using Inheritance with virtual functions.
10. Accessing a particular record in a student's file.
11. Program using Templates.
12. Demonstration of Exception handling.

WEB DESIGNING

Semester: II **Hours: 2**

Code : 20CS2MC03 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Gain the fundamental knowledge on HTML tags.	PSO - 1	K
CO-2	Create web pages using image, tables, frames and forms.	PSO - 1	C
CO-3	Explore DHTML and text effects in creating web pages.	PSO - 1	AP
CO-4	Develop and enhance forms with JavaScript	PSO - 2	C
CO-5	Develop an interactive website using CSS and JavaScript.	PSO - 5	AP

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

Semester: II				**WEB DESIGNING**							**Hours: 2**
Code : 20CS2MC03											**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	5	5	4	4	3	2	5	5	4	3	3	3.91
CO-2	5	5	5	3	3	3	4	4	4	3	3	3.81
CO-3	5	4	4	3	4	2	5	5	4	3	3	3.81
CO-4	5	4	5	3	4	2	4	4	5	4	3	3.91
CO-5	5	5	4	3	3	3	4	5	5	5	4	4.18
Overall Mean Score												**3.92**

Result: The score for this course is **3.92** (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

Get Your Feet with HTML: Understand HTML-Convert Text to HTML-Add comments to your HTML document – Text-Headings-Organize your content with Lists -Understand Hypertext and Links-Formatting Tags. **(6 Hours)**

UNIT II

Create Images, Tables, Frames and Forms: Image Tag - Anchor Tag - Enhance your presentation with Graphics-Creating Table-Understand Frames-Modify your Frames. Working with Buttons – Working with Forms - Creating webpage using Tables, Frames, Forms and Buttons. **(6 Hours)**

UNIT III

Working with Style Sheets: Introducing style sheets – Features -Syntax-External Style sheet-Internal Style Sheet-Inline styles-Multiple style sheet – Background – Font – Border – Outline – Margin – Padding – List-Table -**Working with JavaScript:** Introducing JavaScript-Reviewing HTML and JavaScript used in DHTML - Enhancing Forms with JavaScript. **(6 Hours)**

UNIT IV

Demonstration in Labs: Designing webpage using basic tags - Creating Simple Web Page using all Text Formatting - Web Page with Hyper Links and Images - Web Page with Lists - Web Page with Table - Web Page with Frames. **(6 Hours)**

UNIT V

Demonstration in Labs: Application Form Creation - Resume Preparation using images - Dynamic Website Creation (College, Department) - Personal Webpage creation using Style Sheets - Webpage Creation using JavaScript. **(6 Hours)**

BOOK FOR STUDY

"Web Designing", Sr. S. Jothi, Ms. P.Sathya, Acca Publications, 2015.

UNIT I	**:**	Chapter :1
UNIT II	**:**	Chapter :2
UNIT III	**:**	Chapters :4, 5
UNIT IV, UNIT V	**:**	Demonstration in Lab

BOOKS FOR REFERENCE:

1. **"Web Technologies HTML, JavaScript, PHP, Java, JSP XML and AJAX"** Black Book, Kogent Learning Solutions Inc., Dreamtech Press, 2017.
2. **"Internet & World Wide Web How To Program"**, P. J. Dietal, H. M. Deital, Fourth Edition, Pearson International Edition, 2013.
3. **"Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI",** Ivan Bayross, BPB Publications, New Delhi, 3rd Edition, 2009.

COMPUTER ORIENTED NUMERICAL METHODS

Semester: II **Hours: 5**

Code : 20CS2AC02 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Locate the errors in numerical computation by solving problems	PSO-1	E
CO-2	Find the value of a function Using Interpolation	PSO-2	AN
CO-3	Explain differentiation and Integration	PSO-3	AN
CO-4	Describe different methods to find numerical solution to ordinary differential equations	PSO-3	U
CO-5	Apply numerical methods to solve complex problems	PSO-5	AP

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

Semester: II				COMPUTER ORIENTED NUMERICAL METHODS							Hours: 5
Code : 20CS2AC02											Credits: 4
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO-1	5	5	3	3	4	2	5	5	3	2	2	3.55
CO-2	5	5	3	3	4	3	4	5	3	3	2	3.64
CO-3	5	3	4	2	3	2	5	5	3	2	2	3.27
CO-4	4	4	4	2	4	2	4	5	2	2	2	3.18
CO-5	4	3	3	2	4	3	4	5	3	3	2	3.27
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

Algebraic and Transcendental Equations: Introduction – Errors in Numerical Computation – Iteration Method – Bisection Method – Regular False 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 (only first 3 methods) –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 - Newton-Cote's Quadrature formula – Trapezoidal Rule – Simpson's one third Rule – Simpson's three eight Rule. **(15 Hours)**

UNIT V

Numerical solution ofOrdinary 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.ThangapandiIssacand. A. Soma Sundaram, Second edition, Sci Tech Publication (India) Pvt. Ltd, Chennai, 2002.

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

BOOKS FOR RESERENCE:

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

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 from various disciplines, enhance the interdisciplinary 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 COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Assess the scope and importance of environmental studies and need for public awareness	PO1,2,3
2.	Develop deeper understanding in classification of resources	PO 1,2,5
3.	Analyse the concept of an eco system	PO1,2,4,6
4.	Comprehend the definitions, causes and control measures of environmental pollutions	P O 1 ,5
5.	Participate in the environmental issues programmes from the unsustainable to sustainable development	PO 1 , 4,5,6

ENVIRONMENTAL STUDIES

Semester: II **Hours: 2**

Code : 20AE2ES02 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the components of our planet earth.	PSO 1,2,4	K, A ,S
CO - 2	Elucidate the importance of the natural resources.	PSO 2,3,5	K, An, E
CO - 3	Summarise the energy status of the environment.	PSO1,2,5	K,A,An
CO - 4	Acquire knowledge on the conservation of our environment.	PSO1,4,5	K,AP,S
CO - 5	Analyse the significance of water and climate towards sustainable development.	PSO 2,3,5	K,An, Ap, S,E

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

Semester: II				**ENVIRONMENTAL STUDIES**							**Hours: 2**
Code : 20AE2ES02											**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	4	4	3	4	3	4	5	4	5	4	5	4.09
CO - 2	3	4	3	4	3	4	5	4	4	4	4	3.81
CO - 3	3	4	3	4	3	4	5	4	4	4	4	3.81
CO - 4	3	4	3	4	3	3	5	4	5	5	4	3.90
CO - 5	4	4	3	4	3	4	5	4	4	4	5	4.00
Overall Mean Score for COs												**3.92**

Result: The Score for this Course is **3.92** (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: MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, scope and importance - Need for public awareness **(2 Hours)**

UNIT II: NATURAL RESOURCES

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 life styles. **(8 Hours)**

UNIT III: ECOSYSTEMS

Concept of an ecosystem - Structure and function of an ecosystem - producers, consumers and decomposers - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the following Eco system: Forest, grass land, desert and aquatic. **(6 Hours)**

UNIT IV: 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, Role of an individual in prevention of pollution. **(8 Hours)**

UNIT V: SOCIAL ISSUES AND THE ENVIRONMENTS

From unsustainable to sustainable development - Urban problems related to energy Water conservation, rain water harvesting, water shed 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. Waste land reclamation. Environmental protection act, air act, water act, wild life protection act. **(6 Hours)**

FIELD WORK

Visit to local area to document environmental assets- river/forest/ grassland/hill/ mountain.

COURSE BOOK:

Murugeshan, R., (2007). Environmental science and Engineering, Millenium publication, Madurai.

UNIT I : Section - 1.1 & 1.2

UNIT II : Section - 1.3 to 1.37

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

UNIT IV : Section - 3.1 to 3.37

UNIT V : Section - 4.1 to 4.17

Note: Tamil Version for Tamil Literature and History Tamil Medium Students.

Continuous Internal Assessment Component (CIA)

Theory:

Component	Marks
Internal test I	40
Internal test II	40
Quiz	10
Assignment	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 atleast one Question from allotted Units)

SKILL ENHANCEMENT COMPULSORY COURSE (SECC -2)
CAPACITY BUILDING

PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Fix healthy attitudes and standards to face the outside world.
2.	Develop healthy interpersonal, intrapersonal and social relationships.
3.	Analyze the portrayal of social issues depicted in films that help them aware of the issues and figure out ways to eliminate them.
4.	Identify the role of social media in the present scenario and adopt the positive changes.
5.	Build up qualities like team work, leadership and problem solving
6.	Improve perspectives on positive thinking, team work, and creativity

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Develop positive thinking that helps them to set and pursue for meaningful goals.	PO-1, 6
2.	Develop leadership qualities that lead them to inspire and guide people among peer groups and in workplaces.	PO-1, 2, 3, 6
3.	Assess the advantages and disadvantages of social media.	PO-2, 6
4.	Acquiring trade skills by developing social relationships effectively with trade experts.	PO-2,5,6
5.	Understand the portrayal of social causes in films	PO-3

CAPACITY BUILDING

Semester: II **Hours: 2**
Code : 20SE2CB02 **Credit: 2**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Realised the importance of physical health, emotional well-being, and stress management.	PSO-1	K
CO - 2	Apply the features of team work and strive to become good leaders.	PSO-2,4	Ap
CO - 3	Enhance their awareness on social media and e- learning.	PSO-3	Sy
CO - 4	Develop interactive skills in online trade, and become value based professionals.	PSO-4	Ap
CO - 5	Acquire film making skills.	PSO-5	Ap

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

Semester : II				**CAPACITY BUILDING**							**Hours: 2**
Code : 20SE2CB02											**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	4	4	4	4	4	5	4	4	5	4	4	4.18
CO-2	4	4	5	4	4	4	4	4	4	4	4	4.09
CO-3	4	3	4	4	4	3	4	4	4	4	4	3.81
CO-4	5	4	4	4	4	3	4	4	5	4	3	4
CO-5	4	4	5	4	4	4	3	4	4	4	4	4
Overall Mean Score												**4.01**

Result: The score for this course is **4.01** (Very 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

Positive thinking-Seven steps in dealing with doubts. Traits of positive thinking. Goal setting-techniques of positive thinking to achieve the goals-creativity and components of creativity **(6 Hours)**

UNIT II

Leadership - Types of Leadership - Team work and public speaking - Importance of maintaining good interpersonal relationship with Team - Motivation - Self confidence - Attitude - Working in Group - Time Management - Effective Planning. **(6 Hours)**

UNIT III

Skilful usage of Social media (Whatsapp, Twitter, Facebook, Instagram, other app). Cyber bulling, photo, video morphing & editing, fake news. Useful study apps, e learning apps, Health, Police, Lawyer help app, Social issues complaint app. **(6 Hours)**

UNIT IV

Online interaction with Experts - Mushroom Cultivation - Mrs. Arthi (Batlagundu) -Apiculture -Mrs. Josephine (Madurai), Garment making - Mr. Alagusundaram (Tirupur) - Terrace Garden - Mrs. Megala - (Madurai) - Spirulina Cultivation - D. Aarthi (Madurai) - Antenna Foundation, (Madurai) **(6 Hours)**

UNIT V

Film Review: Thani Oruvan , Peranmai, Dhangal, 36 Vayadhinile, Kaatrin Mozhi, Ratchasi, English Vinglish - Short Film Making-Submission of Short Flim. **(6 Hours)**

BOOKS FOR REFERENCE:

1. Power of positive thinking, Mile, D.J. Rohan Book Company Delhi, 2004.
2. Dolmans 1922, A Handbook Public Speaking 1922, New York, Harcourt Breaee and company.

1. http://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/positive-thinking/art-20043950.
2. http://mayoclinic.org/healthy-lifestyle/stress-management/in-depth/3-simple-strategies-to-help-you-focus-and-de-stress/art-20390057.
3. http://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/3-ways-to-become-more-stress-resilient/art-20267213
4. http://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/3-ways-to-learn-patience-and-amp-up-your-well-being/art-20390072
5. http://www.mayoclinic.org/4-proven-ways-you-can-feel-happier/art-20390079
6. http://mayoclinic.org/healthy-lifestyle/adult-health/in-depth/anger-management/art-20048149

7. http://www.gaiam.com/blogs/discover/positive-thinking-strategies-to-help-you-achieve-yourgoals#:-text=Focus%20on%20what's20%20of20old%20failures.
8. http://www.linkedin.com/pulse/what-makes-positive-attitude-10-components-gary
9. http://ifflab.org/how-to-prevent-cyber-bullying -anti-cyber-bullying-law-in- india/
10. http://www.sciencedaily .com/terms/morphing.htm#:text=Morphing%20 is %special %effect,little%20 instruction%20 from%20the %20 user.
11. http://www.educationalappstore.com/
12. http:// www.mobihealthnews.com/37340/38-more-health-and-wellness-apps-that-connect-to-apples-healthkit
13. http://www.youtube.com/watch?v=skfqt9mm7j4
14. http://www.youtube .com/watch?v-rvy44i-ciE
15. https://www.youtube.com.com/watch?v=rINOELMCiqc
16. http:// www.youtube.com/watch?v=N5R-KCWPzr0&list=PLHw83Z MxtQ9 NdRd5yAxYrxkRsxqcvw iae@index=3
17. http://www.youtube.com/watch?v=PUzaLjSjERE
18. http:// www.youtube.com/watch?v=QkVue8XmVr8
19. http:// www.youtube.com/watch?v=XcRs4JBN43o
20. http:// www.youtube.com/watch?v=dzvpQG-2xC4

Continuous Internal Assessment Component (CIA)
Theory:

Component	Marks
Internal test I	40
Internal test II	40
Quiz	10
Assignment	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 atleast one Question from allotted Units)

பொதுத்தமிழ் - காப்பிய இலக்கியம்

பருவம்: மூன்று **நேரம்: 6**

குறியீடு: 20GT3GS03 **புள்ளி: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	காப்பிய இலக்கியங்களின் சிறப்புக்களை அறிந்து கொள்வர்.	PSO - 1, PSO - 2	புரிதல், அறிவு
CO - 2	ஐம்பெரும் காப்பியங்கள், பிறகாப்பியங்களின் பக்திச்சிறப்புக்களை உணர்ந்து கொள்வர்.	PSO - 1, PSO - 2	புரிதல்
CO - 3	அகப்புற இலக்கியச் செய்திகளை அறிந்து கொள்வர்.	PSO - 1, PSO - 2	அறிவு
CO - 4	வணிகச் செய்திகளைத் தெரிந்து கொள்வர்.	PSO - 2	புரிதல், பயன்படுத்துதல்
CO - 5	தமிழிலக்கியத்தில் காணலாகும் அறவியல், அறிவியல் செய்திகளைத் தெரிந்து கொள்வர்.	PSO - 2	அறிவு

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

Semester: III				பொதுத்தமிழ் - காப்பிய இலக்கியம்							**Hours: 6**
Code : 20GT3GS03											**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	3	3	4	3	3	3	3	2	5	3	3.18
CO - 2	3	3	3	3	3	4	3	3	2	5	3	3.18
CO - 3	3	3	3	3	3	4	3	3	3	3	4	3.18
CO- 4	3	2	3	3	3	3	5	2	2	3	3	3.27
CO - 5	3	3	3	3	3	3	3	5	2	2	3	3
Overall Mean Score												**3.16**

Result: The score for this course is **3.16** (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

சிலப்பதிகாரம் - புகார்க்காண்டம் - வேனில் காதை

மணிமேகலை - சிறைக்கோட்டம் அறக்கோட்டம் ஆக்கிய காதை

வளையாபதி - 3 முதல் 12 பாடல்கள்

அலகு 2

தேம்பாவணி - எசித்து சேர்படலம் - முதல் 15 பாடல்கள் மட்டும்

சீறாப்புராணம் - சாபீர் கடன்றீர்த்த படலம் - (23 பாடல்கள்)

அலகு 3

பொருளிலக்கணம் - அகத்திணை, புறத்திணை

இலக்கிய வரலாறு - காப்பியம் தொடர்பான இலக்கிய வரலாறு

அலகு 4

வணிகத் தமிழ் - சங்க இலக்கியங்கள் உணர்த்தும் வணிகச் செய்திகள்

பக். 75 - 84

வணிகக் கலைச் சொல்லாக்கம் - 50 சொற்கள்

அலகு 5

அறிவியல் தமிழ் - தமிழில் அறிவியல் - பக். 27 - 40

பாட நூல்கள்

1. தமிழ்த்துறை வெளியீடு - ஜெயராஜ் அன்னபாக்கியம் மகளிர் தன்னாட்சிக் கல்லூரி, பெரியகுளம்.
2. கி. இராசா - தமிழ் இலக்கிய வரலாறு
   நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்,
   அம்பத்தூர், சென்னை - 98
   இரண்டாம் பதிப்பு - 2019.

பார்வை நூல்கள்

1. பா. சரவணன் - **சிலப்பதிகாரம்,** சந்தியா பதிப்பகம், சென்னை. 8
   2 ஆம் பதிப்பு - ஜனவரி - 1997.
2. இராம - லட்சுமணன் - **மணிமேகலை,** உமா பதிப்பகம், சென்னை 1
   2 - ஆம் பதிப்பு - 1998.
3. முனைவர் கமலாமுருகன் - **வளையாபதி குண்டலகேசி மூலமும் உரையும்**
   சாரதா பதிப்பகம்,
   சென்னை - 600 014.
4. போரா ந.ம.மரிய அருட்பிரகாசம் (தொ.ஆ) - **தேம்பாவணி**
   மாவிகா அச்சகம், கே. புதூர்,
   மதுரை.
5. செய்குதம்பி பாவலர் - **சீறாப்புராணம்,** யூனிவர்சல் பிரிண்டர்ஸ்,
   வடக்கு உஸ்மான்சாலை, சென்னை
   டிசம்பர் - 2014
6. முனைவர் ச. திருஞான சம்பந்தம் - **யாப்பருங்கலக்காரிகை,** கதிர் பதிப்பகம்,
   திருவையாறு, முதற் பதிப்பு - 2007

7. எம். ஆர். அடைக்கலசாமி - **இலக்கிய வரலாறு,** ராசி பதிப்பகம், சென்னை. முதற்பதிப்பு. 1960

8. மணவை முஸ்தபா - **காலம் தேடும் தமிழ்,** மீரா பதிப்பகம், சென்னை - 40. 1993

9. முனைவர். பொ. மா. பழனிச்சாமி - **இலக்கியக் கதிர்** நியூ செஞ்சுரி புக்ஹவுஸ் சென்னை - 40. முதற்பதிப்பு - 2010

10. நாராயண வேலுப் பிள்ளை - **உரைநடைத் தமிழ், ஐம்பெருங் காப்பியங்கள்,** நர்மதா பதிப்பகம், சென்னை - 108. ஆறாம் பதிப்பு - 2003

PROGRAMMING IN JAVA

Semester: III **Hours: 4**

Code : 20CS3MC04 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain the knowledge on the concepts of Object oriented programming	PSO - 1	K
CO - 2	Construct the program using decision making, branching and looping statements.	PSO - 2	AP
CO - 3	Achieve faster execution of code by developing multithreaded programming	PSO - 1, PSO - 3	U
CO - 4	Identify and fix errors in the code using exception handling techniques	PSO - 2	AN
CO - 5	Design and create the application using applet programming	PSO - 2, PSO - 3	AP

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

Semester: III			**PROGRAMMING IN JAVA**						**Hours: 4**
Code : 20CS3MC04									**Credits: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	2	2	2	3	2	2	5	4	2	2	3	2.64
CO - 2	5	2	4	2	2	2	4	4	4	2	2	3.00
CO - 3	5	4	3	2	4	3	5	4	5	3	2	3.64
CO - 4	3	4	3	3	3	2	4	3	5	3	2	3.18
CO - 5	4	3	3	2	4	2	3	4	4	4	3	3.27
Overall Mean Score												**3.15**

Result: The Score for this Course is: **3.15** (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)**

BOOK FOR STUDY:

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

OPTIMIZATION TECHNIQUES - I

Semester: III **Hours: 2**

Code : 20CS3MC05 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand the meaning of Operations Research and how to use it to write LP in the event of minimum cost or maximum profit.	PSO - 1	K
CO - 2	Convert a real-world problem, given in words, into a mathematical formulation.	PSO - 1, PSO - 4	E
CO - 3	Understand the application of OR and frame a LP Problem with solution - graphical	PSO - 4	E
CO - 4	Optimize LPP to solve optimization problem with artificial variables.	PSO - 1	C
CO - 5	Solve Simplex Methods and Duality in Linear Programming Problems	PSO - 1, PSO - 4	AP

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

Semester: III			**OPTIMIZATION TECHNIQUES - I**								**Hours: 2**
Code : 20CS3MC05											**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	4	4	3	4	2	4	3	3	3	3	4	3.36
CO - 2	3	3	3	3	3	2	4	3	4	3	4	3.18
CO - 3	4	2	3	2	2	3	3	4	3	3	4	3.00
CO - 4	3	3	2	3	3	3	4	3	3	4	4	3.18
CO - 5	3	3	3	3	2	3	3	4	3	4	4	3.18
Overall Mean Score												**3.18**

Result: The Score for this Course is: **3.18** (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 OR - Nature and Features of OR - Scientific Method in OR - Modelling in Operation Research - General Solution Methods for OR Models - Methodology of Operations Research - Applications of OR - Opportunities and Shortcomings of Operations Research.

(6 Hours)

UNIT II

Linear Programming Problem Mathematical Formulation: Introduction - Linear Programming Problem - Mathematical Formulation of the Problem Illustration on Mathematical Formulation of LPPs. **(6 Hours)**

UNIT III

Linear Programming Problem Graphical Solution: Introduction - Graphical Solution Method - Iso-profit approach. **(6 Hours)**

UNIT IV

Linear Programming Simplex Method: Introduction - Basic solution - Degenerate Solution - Basic Feasible Solution - Associated Cost Vector - Improved Basic Feasible Solution - Optimum Basic Feasible Solution - The Computational Procedure - The Simplex Algorithm - Use of Artificial Variables - Two- hase Method - Big-M Method. **(6 Hours)**

UNIT V

Duality in Linear Programming: Introduction - General Primal Dual Pair - Standard Primal Problem - Dual Problem - Formulating a Dual Problem - Dual Simplex Method. **(6 Hours)**

BOOK FOR STUDY:

- **"Operations Research",** Kanti Swarup, P.K. Gupta, Man Mohan, Sultan Chand & Sons Publication, New Delhi, Reprint 2016.

UNIT I	**:**	Chapter : 1.2, 1.3, 1.4, 1.5, 1.7, 1.8, 1.10, 1.11
UNIT II	**:**	Chapter : 2.1, 2.2, 2.3, 2.4
UNIT III	**:**	Chapter : 3.1, 3.2
UNIT IV	**:**	Chapter : 4.1, 4.3, 4.4
UNIT V	**:**	Chapter : 5.1, 5.2, 5.3, 5.9

BOOKS FOR REFERENCE:

1. **"Operations Research"**, R. Veerachamy, V. Ravi Kumar, I.K International Publishing House Pvt. Ltd, New Delhi, Reprint 2012.
2. **"Operations Research"**, A. M. Natarajan, P. Balasubramanie, A. Tamilarasi, Pearson, Dorling Kindersley (India) Pvt. Ltd, Second Edition, 2017.

DIGITAL ELECTRONICS

Semester: III **Hours: 3**

Code : 20CS3AC03 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand number systems and convert number system.	PSO - 1	U
CO - 2	Simplify logical statements with Karnaugh maps.	PSO - 5	AP
CO - 3	Identify Combinational circuit and explain the working principles of decoder, encoder.	PSO - 3	AN
CO - 4	Recognize the working of flip-flops.	PSO - 5	K
CO - 5	Understand the storage of information in registers	PSO - 5	U

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

Semester: III				**DIGITAL ELECTRONICS**							**Hours: 3**
Code : 20CS3AC03											**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	3	3	3	3	3	4	3	3	3	4	3.27
CO - 2	4	4	4	4	4	4	4	3	3	3	4	3.72
CO - 3	3	3	3	3	3	3	4	3	3	3	4	3.27
CO - 4	3	3	3	3	3	3	4	3	3	3	4	3.27
CO - 5	3	3	3	3	3	3	4	3	3	3	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

Digital Logic: The Basic Gates - NOT, OR, AND - Universal Logic Gates - NOR, NAND - AND - OR - Invert Gates - Positive and Negative Logic. **Combinational Logic Circuits:** Boolean Laws and Theorems - Sum-of- Products Method - Truth Table to Karnaugh Map - Pairs, Quads, and Octets - Karnaugh Simplifications - Don't - care Condition - Product-of-sums Method - Product-of-sums Simplification.

(9 Hours)

UNIT II

Data-Processing Circuits: Multiplexers - Demultiplexers - 1-of-16 Decoder - BCD-to-decimal Decoders - Seven-segment Decoders - Encoders - Exclusive-OR Gates - Parity Generators and Checkers - Magnitude Comparator. **(9 Hours)**

UNIT III

Number Systems and Codes: Binary Number System - Binary-to-decimal Conversion - Decimal-to-binary Conversion - Octal numbers - Hexadecimal Numbers - The ASCII Code - The Excess-3 code - The Gray code. **Arithmetic Circuits:** Binary Addition - Binary Subtraction - Unsigned Binary Numbers - Sign-magnitude Numbers - 2's Complement Representation - 2's Complement Arithmetic - Arithmetic Building Blocks - The Adder-subtracter. **(9 Hours)**

UNIT IV

Clocks and Timing Circuits: Schmitt Trigger - 555 Timer-Astable - 555 Timer Monostable. **Flip-Flops:** RS FLIP-FLOPs - Gated FLIP-FLOPs - Edge-triggered RS FLIP-FLOPs - Edge-triggered D FLIP-FLOPs - Edge-triggered JK FLIP-FLOPs - FLIP-FLOP Timing. **(9 Hours)**

UNIT V

Registers: Types of Registers - Serial In-Serial Out - Serial In-Parallel Out - Parallel In- Serial Out - Parallel In -Parallel Out. **Counters:** Asynchronous Counters - Decoding Gates - Synchronous Counter - Changing the Counter Modulus - Decade counters. **(9 Hours)**

BOOK FOR STUDY:

- **"Digital Principles and Applications",** Donald P.Leach, Albert Paul Malvino, Gautam saha, McGraw Hill Education, Eighth Edition, Special Indian Edition, Sixth Reprint 2016.

UNIT I	**:**	Chapters	:2.1 - 2.4, 3.1 - 3.8
UNIT II	**:**	Chapter	:4.1 - 4.9
UNIT III	**:**	Chapters	:5.1, 5.3, 5.5 - 5.10, 6.1 - 6.8
UNIT IV	**:**	Chapters	:7.3 - 7.5, 8.1 - 8.6
UNIT V	**:**	Chapters	:9.1 - 9.5, 10.1 - 10.5

BOOKS FOR REFERENCE:

1. **"Digital Logic and computer design",** M. Morris Mano, Pearson India Education Services Pvt. Ltd, 2016.
2. **"Practical Physics and Electronics",** C. C. Ouseph, U. J. Rao, V. Vijayendran, S. Viswanathan (Printers & Publishers) Pvt. Ltd., Reprint 2014.

COMPUTER ORGANIZATION AND ARCHITECTURE

Semester: III **Hours: 4**

Code : 20CS3DE1A **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recognize and Perform Computations with the functional units of the processor.	PSO - 1	K
CO - 2	Understand the Register Transfer Logic and Various Micro Operations in a Computer.	PSO - 1, PSO - 2	U
CO - 3	Describe fundamentals concepts of pipeline and vector processing.	PSO - 1, PSO - 3	C
CO - 4	Distinguish the organisation of various parts of a system memory hierarchy.	PSO - 2, PSO - 4	AN
CO - 5	Identify the interconnection structure in multiprocessors	PSO - 2	AN

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

Semester: III			**COMPUTER ORGANIZATION AND ARCHITECTURE**						**Hours: 4**			
Code : 20CS3DE1A												**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	2	2	4	2	2	4	4	3	4	2	2	2.82
CO - 2	3	2	3	2	3	3	4	3	3	3	4	3.00
CO - 3	4	3	4	4	3	3	4	4	4	2	2	3.36
CO - 4	4	3	3	2	3	2	4	4	3	4	4	3.27
CO - 5	3	4	3	2	3	2	4	3	4	3	4	3.18
Overall Mean Score												**3.13**

Result: The Score for this Course is: **3.13** (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

Data Representation: Data Types - Complements - Fixed-Point Representation - Floating-Point Representation - Other Binary Codes - Error Detection Codes. **Register Transfer and Microoperations:** Register Transfer Language - Register Transfer - Bus and Memory Transfers - Arithmetic Micro operations - Logic Micro Operations - Shift Micro operations - Arithmetic Logic Shift Unit. **(12 Hours)**

UNIT II

Basic Computer Organization and Design: Instruction Codes - Computer Registers - Computer Instructions - Instruction Cycle - Memory-Reference Instructions - Input-Output and Interrupt. **Programming the Basic Computer:** Introduction - Machine Language - Assembly Language - The Assembler - Program Loops - Programming Arithmetic and Logic Operations - Subroutines - Input-Output Programming. **(12 Hours)**

UNIT III

Micro Programmed Control: Control Memory - Address Sequencing - Micro Program Example - Design of Control Unit. **Central Processing Unit:** Introduction - General Register Organization - Stack Organization - Instruction Formats - Addressing Modes - Data Transfer and Manipulation - Program Control - Reduced Instruction Set Computer (RISC). **(12 Hours)**

UNIT IV

Pipeline and Vector Processing: Parallel Processing - Pipelining - Arithmetic Pipeline - Instruction Pipeline - RISC Pipeline - Vector Processing - Array processors. **Input - Output Organization:** Peripheral Devices - Input-Output Interface - Synchronous Data Transfer - Modes of Transfer - Priority Interrupt - Direct Memory Access. **(12 Hours)**

UNIT V

Memory Organization: Memory Hierarchy - Main Memory - Auxiliary Memory - Associative Memory - Cache Memory - Virtual Memory. **Multiprocessors:** Characteristics of Multiprocessors - Interconnection Structures - Interprocessor Arbitration - Interprocessor Communication and Synchronization. **(12 Hours)**

BOOK FOR STUDY:

- "**Computer System Architecture**", M. Morris Mano, Rajib Mall, Third Edition, Prentice Hall of India Private Limited, New Delhi, Reprint 2017.

UNIT I	**:**	Chapters	: 3, 4.1 - 4.7
UNIT II	**:**	Chapters	: 5.1 - 5.3, 5.5, 5.6, 6
UNIT III	**:**	Chapters	: 7, 8
UNIT IV	**:**	Chapters	: 9, 11.1 - 11.6
UNIT V	**:**	Chapters	: 12.1 - 12.6, 13.1 - 13.4

BOOKS FOR REFERENCE:

1. "**Computer Organization and Architecture**", William Stallings, Tenth Edition, Pearson Education, 2016.
2. **"Computer Architecture and Organization",** John P. Hayes, Third Edition, Mc Graw Hill Education, Reprint 2017.

CLOUD COMPUTING

Semester: III **Hours: 4**

Code : 20CS3DE1B **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define Cloud Computing principles and paradigms of Cloud Computing.	PSO - 1	U
CO - 2	Describe the importance of virtualization along with their technologies.	PSO - 1, PSO - 2	K
CO - 3	Summarize various applications and technologies.	PSO - 1, PSO - 2	AN
CO - 4	Analyze the components of open stack & Google Cloud platform and understand Mobile Cloud Computing and Amazon web Service.	PSO - 2, PSO - 5	U
CO - 5	Impart the skills to develop Cloud applications in emerging trends.	PSO - 3, PSO - 5	AP

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

Semester: III				**CLOUD COMPUTING**							**Hours: 4**
Code : 20CS3DE1B											**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	3	3	2	2	2	4	3	3	2	4	2.82
CO - 2	3	3	3	2	2	5	3	3	5	2	3	3.09
CO - 3	4	3	3	2	2	5	3	3	5	3	4	3.36
CO - 4	3	3	3	2	2	4	4	3	4	3	3	3.09
CO - 5	3	3	3	2	2	4	4	4	5	4	4	3.45
Overall Mean Score												**3.16**

Result: The Score for this Course is: **3.16** (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: Cloud Computing at a Glance - Historical Developments - Building Cloud Computing Environments - Computing Platforms and Technologies. **Principles of Parallel and Distributed Computing:** Eras of Computing - Parallel vs. Distributed Computing - Elements of Parallel Computing - Elements of Distributed Computing - Technologies for Distributed Computing. **(12 Hours)**

UNIT II

Virtualization: Introduction - Characteristics of Virtualized Environments - Taxonomy of Virtualization Techniques - Virtualization and Cloud Computing - Pros and Cons of Virtualization - Technology Examples. **Cloud Computing Architecture:** Introduction - Cloud Reference Model - Types of Clouds - Economics of the Cloud - Open Challenges. **(12 Hours)**

UNIT III

Anek: Cloud Application Platform: Framework Overview - Anatomy of the Aneka Container - Building Aneka Clouds - Cloud Programming and Management. **Concurrent Computing: Thread Programming:** Introducing Parallelism for Single Machine Computation - Programming Applications with Threads - Multithreading with Aneka - Programming Applications with Aneka Threads. **(12 Hours)**

UNIT IV

High-Throughput Computing: Task Programming: Task Computing - Task Based Application Models - Aneka Task-Based Programming. **Data Intensive Computing: Map-Reduce Programming:** Data-Intensive Computing - Technologies for Data-Intensive Computing - Aneka MapReduce Programming . **Cloud Platforms in Industry:** Amazon Web Services - Google AppEngine - Microsoft Azure. **(12 Hours)**

UNIT V

Cloud Applications: Scientific Applications - Business and Consumer Applications. **Advanced Topics in Cloud Computing:** Energy Efficiency in Clouds - Market Based Management of Clouds - Federated Clouds/InterCloud - Third Party Cloud Services. **(12 Hours)**

BOOK FOR STUDY:

- **"Mastering Cloud Computing"-** Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, McGraw Hill Education, Sixth Reprint 2016.

UNIT I	**:**	Chapters	: 1, 2
UNIT II	**:**	Chapters	: 3, 4
UNIT III	**:**	Chapters	: 5, 6
UNIT IV	**:**	Chapters	: 7, 8, 9
UNIT V	**:**	Chapters	: 10, 11

BOOKS FOR REFERENCE:

1. **"Cloud Computing",** M. N. Rao, PHI Learning Private Limited, New Delhi, 2015.
2. **"Cloud Computing",** Swarup K. Das, Dominant Publishers & Distributers Pvt. Ltd., New Delhi, 2015.

EMBEDDED SYSTEMS

Semester: III **Hours: 4**

Code : 20CS3DE1C **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand hardware and software design requirements of embedded systems.	PSO - 1	U
CO - 2	Analyze the embedded systems' specification and develop software programs.	PSO - 2, PSO - 5	AN
CO - 3	Learn to develop the hardware for embedded system application based on the processors.	PSO - 3	K
CO - 4	Incorporate suitable microcontroller along with appropriate interfacing circuits and implement the same for an application with software programs	PSO - 5	C
CO - 5	Explore the features of the microcontrollers and provide apt solutions for any embedded application	PSO - 5	AN

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

Semester: III				EMBEDDED SYSTEMS							Hours: 4
Code : 20CS3DE1C											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	3	3	3	3	3	4	4	4	4	4	3.45
CO - 2	4	4	4	4	4	4	4	3	3	2	4	3.60
CO - 3	3	3	3	3	3	3	4	4	4	4	4	3.45
CO - 4	3	3	3	3	3	3	4	3	3	3	4	3.18
CO - 5	3	3	3	3	3	3	4	4	4	4	4	3.45
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

Introduction to Embedded Systems: Embedded System - Embedded Systems Vs General Computing Systems - History of Embedded Systems - Classification of Embedded System - Relation between Microcontroller and Embedded System, Major Application Areas, Purpose of Embedded Systems. **The Typical Embedded System**: Core of the Embedded System - Memory - Sensors and Actuators - Communication Interface - Embedded firmware - Other system Components - PCB and Passive Components. **(12 Hours)**

UNIT II

Characteristics and Quality Attributes of Embedded Systems: Characteristics of Embedded Systems, Quality Attributes of Embedded Systems. **Designing Embedded systems with 8 bit controller**: Factors to be considered in selecting a controller - Why 8051 microcontroller - Designing with 8051 - the 8052 microcontroller. **(12 Hours)**

UNIT III

Programming the 8051 Microcontroller - Different addressing modes supported by 8051 - The 8051 Instruction Set. **Hardware Software Co-Design and Program Modelling**: Fundamental Issues in Hardware Software Co-Design - Computational Models in Embedded Design - Introduction to Unified Modelling Language. **(12 Hours)**

UNIT IV

Embedded Hardware Design and Development: Analog Electronic Components - Digital Electronic Components - VLSI and Integrated Circuit Design - Electronic Design Automation (EDA) Tools - The PCB Layout Design - Printed Circuit Board (PCB) Fabrication. **(12 Hours)**

UNIT V

Embedded Firmware Design and Development: Embedded Firmware Design Approaches - Embedded Firmware Development Languages - Programming in Embedded C. **(12 Hours)**

BOOK FOR STUDY:

- **"Introduction to Embedded Systems"** - Shibu K.V, Mc Graw Hill Education (Inida) Private Limited, Second Edition, Reprint 2018.

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

BOOKS FOR REFERENCE:

1. **"Embedded Systems",** Raj Kamal, Mcgraw Hill Education (India) Private Limited, Third Edition, 2016.
2. **"Embedded/Real-Time Systems: Concepts, Design & Programming",** Dr. K. V. K. K. Prasad, Dreamtech Press, Black Book, Revised Edition 2005.

PROGRAMMING IN JAVA - LAB

Semester: III **Hours: 3**

Code : 20CS3CP03 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Design simple Java programs to demonstrate the OOPs concepts	PSO - 1	AP
CO - 2	Develop programs using inheritances and interfaces in JAVA	PSO - 2, PSO - 3	AP
CO - 3	Create and implement the packages in real time applications	PSO - 2	C
CO - 4	Write Java programs using multithreading and solving errors with exception handling mechanisms	PSO - 3, PSO - 5	C
CO - 5	Design and develop applet program in Java	PSO - 3, PSO - 5	AP

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

Semester: III				**PROGRAMMING IN JAVA - LAB**							**Hours: 3**
Code : 20CS3CP03											**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	5	3	3	2	3	2	4	3	5	4	4	3.45
CO - 2	3	5	4	4	5	3	5	5	4	5	4	4.27
CO - 3	5	5	3	4	4	3	5	3	4	4	4	4.00
CO - 4	4	4	3	3	2	2	5	3	4	3	4	3.36
CO - 5	5	3	3	2	3	2	4	3	5	4	4	3.45
Overall Mean Score												**3.71**

Result: The Score for this Course is: **3.71** (High Relationship)

Note:

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

Values Scaling:

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

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, Multiplication and Transpose)
    c. Stack and Queue operations.
3. **Constructors and Method overloading**
    a. Electricity Bill preparation
    b. Complex Number operation
4. **String Methods**
    a. String Sorting and Searching
    b. Program using string methods
5. **Inheritance**
    a. Staff information System
    b. Railway Reservation.
6. **Package & Interface**
    a. Bank transaction
    b. Mark Sheet Processing
    c. Employee Details using Interface
7. **Exception Handling and Threads**
    a. Programs using built in and user defined Exceptions
    b. Program using Multithreading
8. **Files**
    a. Counting no of lines, words and characters in a file
    b. CIA record preparation for 'n' students.
9. **Scientific Calculator using Applet**

DIGITAL ELECTRONICS - LAB

Semester: III **Hours: 2**

Code : 20CS3AP01 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Explain the working of Logic Gates.	PSO - 1	U
CO - 2	Write Boolean equation by logic circuits and verify its truth table.	PSO - 2	AP
CO - 3	Design Half adder, Full Adder and subtractor	PSO - 3	AP
CO - 4	Demonstrate working of flip-flops and verify the truth table	PSO - 4, PSO - 5	C
CO - 5	Develop a digital logic and apply it to solve real life problems.	PSO - 5	AP

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

Semester: III			**DIGITAL ELECTRONICS - LAB**						**Hours: 2**		
Code : 20CS3AP01											**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	3	3	3	3	4	4	4	4	4	3.45
CO - 2	3	3	3	3	3	3	4	4	3	3	3	3.18
CO - 3	3	3	3	3	3	3	4	4	4	4	4	3.45
CO - 4	3	3	3	3	3	3	4	4	4	4	4	3.45
CO - 5	4	4	4	4	4	4	3	3	3	4	4	3.72
Overall Mean Score												**3.45**

Result: The Score for this Course is: **3.45** (High Relationship)

Note:

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

Values Scaling:

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

1. Experimenting the truth table of basic logic gates
2. Design the circuit for the given expression.
3. Design Half Adder
4. Design Full Adder
5. Design Subtractor
6. Verifying the truth table of RS Flip-Flop
7. Verifying the truth table of JK Flip-Flop
8. Verifying the truth table of D Flip-Flop

பொதுத்தமிழ் - பழந்தமிழ் இலக்கியம்

பருவம்: நான்கு **நேரம்: 6**

குறியீடு: 20GT 4GS04 **புள்ளி: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	பழந்தமிழ் இலக்கிய வளங்களை அறிந்து கொள்வர்.	PSO - 2	அறிவு
CO - 2	பழந்தமிழ் இலக்கியங்களின் சமூகநிலையைப் புரிந்து கொள்வர்.	PSO - 2	புரிதல், அறிவு
CO - 3	பழந்தமிழ் இலக்கியத்தின் தனித்தன்மையை அறிந்து கொள்வர்.	PSO - 2	அறிவு
CO - 4	பழந்தமிழ் இலக்கியத்தில் காணப்படும் நயங்களைத் தெரிந்து கொள்வர்.	PSO - 2	புரிதல்
CO - 5	பழந்தமிழ் இலக்கிய ஆசிரியர்களை அடையாளம் காண்பர்.	PSO - 2	பயன்படுத்துதல்

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

Semester: IV				பொதுத்தமிழ் - பழந்தமிழ் இலக்கியம்							**Hours: 6**
Code : 20GT 4GS04											**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	3	3	3	3	4	3	3	3	3	3	3.09
CO - 2	3	3	3	4	3	4	4	3	3	4	2	3.27
CO - 3	3	3	3	3	3	3	3	3	3	3	4	3.09
CO- 4	3	4	3	3	3	3	3	3	3	3	3	3.09
CO - 5	3	3	3	3	3	3	3	3	3	3	3	3.00
Overall Mean Score												**3.10**

Result: The score for this course is **3.10** (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: சங்க இலக்கியங்கள் - எட்டுத்தொகை

1. **நற்றிணை (2 பாடல்கள்)**

"கேளாய், எல்ல தோழி..." (குறிஞ்சி: பாடல் - 61)

"பிரசம் கலந்த வெண் சுவைத் தீம்பால்..." (பாலை: பாடல் - 110)

2. **குறுந்தொகை (5 பாடல்கள்)**

"நெய்கனி குறும்பூழ்க்....." (குறிஞ்சி: பாடல் - 389)

"ஊருண் கேணி....." (மருதம்: பாடல் - 399)

"நசைபெரி துடையர்....." (பாலை: பாடல் - 37)

"பூவிடைப் படினும் யாண்டு....." (நெய்தல்: பாடல் - 57)

"மழைவிளை யாடும் ....." (முல்லை: பாடல் - 108)

3. **கலித்தொகை (1 பாடல்)**

"உண்கடன் வழிமொழிந்து இரங்குங்கால்....." - பாலைக்கலி - தோழிக்கூற்று

4. **அகநானூறு (2 பாடல்கள்)**

"வான் கடற் பரப்பில் தூவற்கு எதிரிய....." (நெய்தல்: பாடல் - 10)

"யாயே கண்ணினும் கடுங் காதலே! ....." (குறிஞ்சி: பாடல் - 12)

5. **புறநானூறு (2 பாடல்கள்)**

"அரிமயிர்த் திரள் முன்கை....." (பாடல்: 11)

"பாணர் தாமரை மலையவும், புலவர்....." (பாடல்: 12)

அலகு 2: பத்துப்பாட்டு

நெடுநல்வாடை முழுவதும்

அலகு 3: நீதி நூல்கள்

1. **திருக்குறள்** : **அறத்துப்பால்** - செய்நன்றி அறிதல் - ஈகை

2. **நாலடியார் : பொருட்பால்**

கல்வி - "குஞ்சி யழகும்..." முதல் "அலகுசால் கற்பின் ---" வரை (10 பாடல்கள்)

அறிவுடைமை - "பகைவர் பணிவிடம்..." முதல் "கருமமு முட்படா --" வரை (10 பாடல்கள்)

அலகு 4: இலக்கணம்

வல்லெழுத்து மிகும் இடம், மிகா இடம்

அலகு 5: இலக்கிய வரலாறு

சங்க காலம், சங்கம் மருவிய காலம் தொடர்பான இலக்கிய வரலாறு.

பாடநூல் :

1. தமிழ்த்துறை வெளியீடு - ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி. பெரியகுளம்.

2. கி. இராசா - தமிழ் இலக்கிய வரலாறு
நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்,
அம்பத்தூர், சென்னை - 98
இரண்டாம் பதிப்பு - 2019.

பார்வை நூல்கள்:

1. வ.த. இராமசுப்பிரமணியம் (உ.ஆ) - **நற்றிணை**
   திருமகள் நிலையம்,
   முதற் பதிப்பு - 2009.

2. புலவர் துரை இராசாராம் (உ.ஆ) - **குறுந்தொகை**
   திருமகள் நிலையம்,
   சென்னை. முதற் பதிப்பு 2008

3. முனைவர்.அ.விசுவநாதன் (உ.ஆ) - **கலித்தொகை**
   பாவைபிரிண்டர்ஸ்,
   சென்னை - 2007.

4. வ.த.இராமசுப்பிரமணியம் (உ.ஆ) - **அகநானூறு**
   திருமகள் நிலையம், சென்னை
   முதற் பதிப்பு 2009.

5. வ.த.இராமசுப்பிரமணியம் (உ.ஆ) - **புறநானூறு**
   திருமகள் நிலையம, சென்னை.
   முதற் பதிப்பு 2008.

6. முனைவர்.இரா.மோகன் (உ.ஆ) - **பத்துப்பாட்டு (பகுதி - 2)**
   நியூ செஞ்சுரி புக் ஹவுஸ்,
   சென்னை - 98,
   முதற் பதிப்பு - 2007.

7. எஸ். கௌமாரீஸ்வரி (பதி.ஆ) - **திருக்குறள் பரிமேலழகர் உரை**
   சாரதா பதிப்பகம், சென்னை - 600 014,
   முதற்பதிப்பு - 2002.

8. எஸ். கௌமாரீஸ்வரி (பதி.ஆ) - **பதினெண்கீழ்க்கணக்கு நூல்கள்**
   சாரதா பதிப்பகம், சென்னை - 14,
   முதற்பதிப்பு - மார்ச் - 2009.

MICROPROCESSOR

Semester: IV **Hours: 4**

Code : 20CS4MC06 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Explain about the architecture of microprocessor.	PSO - 1	K
CO - 2	Illustrate the Bus structure and communication of microprocessor	PSO - 5	AN
CO - 3	Write assembly language programs and debug the programs.	PSO - 3	AP
CO - 4	Illustrate the design aspects of I/O and memory interfacing circuits	PSO - 5	C
CO - 5	Demonstrate programming using the various addressing modes and instruction set of 8085 microprocessor	PSO - 5	AN

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

Semester: IV				**MICROPROCESSOR**							**Hours: 4**
Code : 20CS4MC06											**Credits: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	4	3	3	3	3	4	3	4	3	4	3.36
CO - 2	3	3	3	3	3	3	4	4	3	3	3	4
CO - 3	3	3	3	4	3	3	3	4	3	4	4	3.36
CO - 4	3	3	3	3	3	3	4	4	4	3	4	3.36
CO - 5	4	3	4	3	4	4	3	3	3	4	4	3.55
Overall Mean Score												**3.53**

Result: The Score for this Course is: **3.53** (High Relationship)

Note:

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

Values Scaling:

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

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. **(12 Hours)**

UNIT II

Microprocessor Architecture and Microcomputer Systems: Microprocessor Architecture and its Operations - Memory. **8085 Microprocessor Architecture and Memory Interfacing**: The 8085 MPU - Memory Interfacing - Interfacing the 8155 Memory Segment - Testing and Troubleshooting Memory Interfacing Circuits. **(12 Hours)**

UNIT III

Introduction to 8085 Instructions: Data Transfer (Copy) Operations - Arithmetic Operations - Logic Operations - Branch Operations - Writing Assembly Language Programs - Debugging a Problem. **(12 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. **Counters and Time Delays:** Counters and Time Delays - Debugging Counter and Time Delay Programs.

(12 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. **(12 Hours)**

BOOK FOR STUDY:

- **"Microprocessor Architecture, Programming and Applications with the 8085",** Ramesh Gaonkar, PENRAM International Publishing (I) PVT. LTD., Sixth Edition, 2017 (Reprint).

  UNIT I : Chapters : 1, 2.1 - 2.5

  UNIT II : Chapters : 3.1, 3.2, 4.1, 4.3, 4.4, 4.6

  UNIT III : Chapter :6.1 - 6.6

  UNIT IV : Chapters :7.1-7.5, 8.1, 8.5

  UNIT V : Chapters :9.1- 9.3, 10.1 - 10.6,10.8

BOOKS FOR REFERENCE:

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

OPTIMIZATION TECHNIQUES - II

Semester: IV **Hours: 2**

Code : 20CS4MC07 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Build and solve Transportation problems using appropriate method.	PSO - 1, PSO - 2	K
CO - 2	Acquire the knowledge to solve Assignment problems using appropriate method.	PSO - 1, PSO - 2	K
CO - 3	Solve simple problems of replacement and implement practical cases of decision making under different business environments.	PSO - 5	C
CO - 4	Design and solve simple models of CPM and queuing to improve decision making and develop critical thinking and objective analysis of decision problems.	PSO - 3, PSO - 5	AP
CO - 5	Work out PERT/CPM techniques in efficient scheduling of activities in network problem	PSO - 4	AP

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

Semester: IV			**OPTIMIZATION TECHNIQUES - II**						**Hours: 2**		
Code : 20CS4MC07											**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	3	3	3	4	4	4	4	4	4	4	3.63
CO - 2	3	3	3	3	3	4	4	4	3	3	3	3.27
CO - 3	3	3	3	4	3	4	4	4	4	4	4	3.63
CO - 4	3	3	3	3	3	4	4	4	4	4	4	4
CO - 5	3	4	4	4	4	4	3	3	3	4	4	3.63
Overall Mean Score												**3.63**

Result: The Score for this Course is: **3.63** (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

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.

(6 Hours)

UNIT II

The Transportation Problem (Continued): Finding an Initial Basic Feasible Solution - NWC Rule - Matrix Minima Method - VAM - Test for Optimality - UV method - Degeneracy in Transportation Problem - Transportation Algorithm (MODI Method). Stepping Stone Solution Method - Some Exceptional Cases - Transportation Problem - Unbalanced Transportation Problem - Transhipment Problems - Time minimization. **(6 Hours)**

UNIT III

Assignment Problem: Introduction - Mathematical Formulation of the Problem - Solution methods of Assignment Problem - Special Cases in Assignment Problem - A typical Assignment Problem - The Travelling Salesman Problem. **(6 Hours)**

UNIT IV

GAMES AND STRATEGIES: Introduction - Two-Person Zero-Sum Games - Some Basic Terms - The Maximin-Minimax Principle - Games Without Saddle Points - Mixed Strategies - Graphic Solution of 2 x n and m x 2 Games - Dominance Property. **(6 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.

(6 Hours)

BOOK FOR STUDY:

- **"Operations Research",** Kanti Swarup, P.K. Gupta, Man Mohan, Sultan Chand & Sons Publication, New Delhi, Reprint 2016.

UNIT I	**:**	Chapter	: 10.1, 10.2, 10.4 - 10.6, 10.8
UNIT II	**:**	Chapter	: 10.9, 10.10, 10.12,10.13 - 10.17
UNIT III	**:**	Chapter	: 11.1 - 11.5, 11.7
UNIT IV	**:**	Chapter	: 17.1 - 17.7
UNIT V	**:**	Chapter	: 25.1 - 25.4, 25.6 - 25.8

BOOKS FOR REFERENCE:

1. **"Operations Research"**, R. Veerachamy, V. Ravi Kumar, I.K International Publishing House Pvt. Ltd, New Delhi, Reprint 2012.
2. **"Operations Research"**, A. M. Natarajan, P. Balasubramanie, A. Tamilarasi, Pearson, Dorling Kindersley (India) Pvt. Ltd, Second Edition, 2017.

COMPUTER GRAPHICS

Semester: IV **Hours: 3**

Code : 20CS4AC04 **Credits: 3**

COURSE OUTCOMES:

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

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

Semester: IV				**COMPUTER GRAPHICS**							**Hours: 3**
Code : 20CS4AC04											**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	3	3	3	4	4	4	4	4	4	4	3.63
CO - 2	3	3	3	3	3	4	4	4	3	3	3	3.27
CO - 3	3	3	3	4	3	4	4	4	4	4	4	3.63
CO - 4	3	3	3	3	3	4	4	4	4	4	4	3.99
CO - 5	3	4	4	4	4	4	3	3	3	4	4	3.63
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

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. **(9 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. **(9 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. **(9 Hours)**

UNIT IV

Two-Dimensional Viewing: The Viewing Pipeline - Viewing Coordinate Reference Frame - Window-to-View Port Coordinate Transformation - Two-Dimensional Viewing Functions - Clipping Operations - Point Clipping - Line Clipping - Polygon Clipping - Curve Clipping - Text Clipping - Exterior Clipping. **Structures and Hierarchical Modeling:** Structure Concepts - Editing Structures - Basic Modeling Concepts - Hierarchical Modeling with Structures. **(9 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. **(9 Hours)**

BOOK FOR STUDY:

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

UNIT I	**:**	Chapters	: 1, 2
UNIT II	**:**	Chapter	: 3
UNIT III	**:**	Chapters	: 4.1 - 4.7, 5.1, 5.3, 5.4, 5.6-5.8
UNIT IV	**:**	Chapters	: 6, 7
UNIT V	**:**	Chapters	: 9, 16

BOOKS FOR REFERENCE:

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

DATA STUCTURES AND COMPUTER ALGORITHMS

Semester: IV **Hours: 4**

Code : 20CS4DE2A **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Learn the fundamental Concepts of Data Structures	PSO - 1	K
CO - 2	Recognize the working principles of Linked List, Stack, Queue and Trees.	PSO - 1	U
CO - 3	Develop deep knowledge in various sorting algorithms, including insertion sort, selection sort and merge sort	PSO - 2	AP
CO - 4	Understand the mapping of real-world problems to algorithmic solutions.	PSO - 2, PSO - 3	AN
CO - 5	Analyze Binary Search trees and other Trees in data structures.	PSO - 5	AN

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

Semester: IV			**DATA STUCTURES AND COMPUTER ALGORITHMS**						**Hours: 4**			
Code : 20CS4DE2A												**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	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	3	3	3.91
CO - 4	5	4	5	4	3	3	5	5	5	3	3	4.09
CO - 5	5	4	5	4	3	3	5	5	5	3	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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I

INTRODUCTION AND OVERVIEW: Basic Terminology; Elementary Data Organization - Data Structures - Data Structure Operations. **ARRAYS, records AND POINTERS:** Linear Arrays - Representation of Linear Arrays in Memory - Traversing Linear Arrays - Inserting and Deleting - Sorting: Bubble Sort - Searching: Linear Search - Binary Search. **(12 Hours)**

UNIT II

LINKED LISTS: Linked Lists - Representation of Linked List in Memory - Traversing a Linked List - Searching a Linked List - Memory Allocation; Garbage Collection - Insertion into a Linked List - Deletion from a Linked List - Header Linked List - Two- way Lists. **(12 Hours)**

UNIT III

STACKS, QUEUES, RECURSION: Stacks - Array Representations of Stacks - Linked Representations of Stacks -Arithmetic Expressions; Polish Notation - Quicksort, an Application of Stacks - Recursion - Towers of Hanoi. Queues - Linked Representation of Queues - Deques - Priority Queues. **(12 Hours)**

UNIT IV

TREES: Binary Trees - Representing Binary Tress in Memory - Traversing Binary Trees- Binary Search Tree - Searching and Inserting in Binary Search Trees - Deleting in Binary Search Trees - B- Trees - Searching, Insertion and Deletion in a B- tree - Heap - Heap Sort. **(12 Hours)**

UNIT V

GRAPH AND THEIR APPLICATIONS: Graph Theory Terminology - Sequential Representation of Graphs; Adjacency Matrix; Path matrix - Warshall's Algorithm; Shortest path - Linked Representation of a Graphs - Operation on Graph - Traversing a Graph**. SORTING AND SEARCHING:** Sorting - Insertion Sort - Selection Sort - Merge-Sort - Radix Sort. **(12 Hours)**

BOOK FOR STUDY:

- **"Data Structures",** Seymour Lipschutz, Tata McGraw Hill Publishing Company Limited, New Delhi, Reprint 2011.

UNIT I	**:**	Chapters	: 1.1 - 1.4, 4.1 - 4.8
UNIT II	**:**	Chapter	: 5.1 - 5.10
UNIT III	**:**	Chapter	: 6.1 - 6.8, 6.10 - 6.13
UNIT IV	**:**	Chapter	: 7.1 - 7.4, 7.7 - 7.9, 7.15 - 7.17
UNIT V	**:**	Chapters	: 8.1 - 8.7, 9.1 - 9.7

BOOKS FOR REFERENCE:

1. **"Data Structures Through C++",** G. Dileep Kumar, Manoj Kumar Singh, Narosa Publishing House Pvt. Ltd., 2015.
2. **"Fundamentals of Computer Algorithms",** Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, University Press (Inida) Private Limited, Second Edition, Reprint 2012.

COMPILER DESIGN

Semester: IV **Hours: 4**

Code : 20CS4DE2B **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Realize basics of compiler design and apply it in real time applications	PSO - 1	K
CO - 2	Analyze different types of parsing techniques to solve the problem	PSO - 2	U
CO - 3	Use optimizing techniques to reduce the number of instructions in a program.	PSO - 4	K
CO - 4	Assess the role of lexical analysis and syntax analysis to find the errors	PSO - 3	AN
CO - 5	Identify the transformation of source code into machine code by the compiler	PSO - 4, PSO - 5	U

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

Semester: IV			**COMPILER DESIGN**						**Hours: 4**		
Code : 20CS4DE2B											**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	3	2	3	4	3	5	4	3	4	4	3.45
CO - 2	4	3	2	2	3	2	4	3	3	4	3	3.00
CO - 3	4	3	3	2	3	3	3	4	3	3	3	3.09
CO - 4	3	3	2	3	2	3	4	3	4	3	3	3.00
CO - 5	3	2	3	2	3	3	4	2	3	2	2	2.64
Overall Mean Score												**3.04**

Result: The Score for this Course is: **3.04** (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: Language Processors -The structure of a compiler - the evolution of programming languages - the science of building compiler - applications of compiler technology - Programming language basics. **A Simple syntax - Directed Translator:** Introduction - Syntax definition - syntax directed translation - Parsing-Lexical analysis - Symbol tables - Intermediate Code generation.

(12 Hours)

UNIT II

Lexical Analysis: The role of the Lexical analyzer - input buffering - specification of tokens - recognition of tokens - the lexical analyzer generator Lex - Finite automata - Form regular expressions to automata - design of a lexical analyzer generator - optimization of DFA based pattern matchers. **(12 Hours)**

UNIT III

Syntax analysis : Introduction - Context-Free Grammars - Writing a grammar - Top - down parsing - bottom up parsing - Introduction to LR Parsing: Simple LR - Parser Generators. **(12 Hours)**

UNIT IV

Intermediate Code Generation: Variants of Syntax Trees - Three address code - Types and declarations - translations of expressions - type checking - control flow - Backpatching - Switch statements - Intermediate code for procedures.

(12 Hours)

UNIT V

Code generation : Issues in the Design of a code generator - The target language - address in the target code - basics blocks and flow graphs - optimization of basic blocks - a simple code generator - Peephole optimization - register allocation and assignment - instruction selection by tree rewriting - optimal code generation for expressions - dynamic programming code generation.

(12 Hours)

BOOK FOR STUDY:

- **"Compilers Principles, Techniques and Tools",** Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Pearson Education, Dorling Kindersley (India) Pvt. Ltd , Second Edition, First Impression 2011.

UNIT I	**:**	Chapters	:	1, 2
UNIT II	**:**	Chapter	:	3
UNIT III	**:**	Chapter	:	4
UNIT IV	**:**	Chapter	:	6
UNIT V	**:**	Chapter	:	8

BOOKS FOR REFERENCE:

1. **"Crafting a Compiler with C"**, Charles N. Fischer, Richard J. LeBlanc, Jr. Pearson Education, Fourth Impression 2015.
2. **"Advanced Compiler Design Implementation",** Steven S. Muchnick, Elsevier, a division of Reed Elsevier India private Ltd, 2013.

DISTRIBUTED SYSTEMS

Semester: IV **Hours: 4**

Code : 20CS4DE2C **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand the software components of distributed systems.	PSO - 1	K
CO - 2	Develop knowledge on communication and interconnection architecture of multiple computer systems.	PSO - 1,4	AN
CO - 3	Examine the difficulties of distributed computing resources.	PSO - 1	AN
CO - 4	Understand Peer-to-Peer Systems, Security and Distributed System to the real world scenario.	PSO - 6, PSO - 4	U
CO - 5	Familiar with the Distributed Transactions, Replication and Distributed Multimedia Systems and their issues of distributed system.	PSO - 3, PSO - 4	K

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

Semester: IV			**DISTRIBUTED SYSTEMS**								**Hours: 4**
Code : 20CS4DE2C											**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	3	2	3	4	3	5	4	3	4	4	3.45
CO - 2	4	3	2	2	3	2	4	3	3	4	3	3.00
CO - 3	4	3	3	2	3	3	3	4	3	3	3	3.09
CO - 4	3	3	2	3	2	3	4	3	4	3	3	3.00
CO - 5	3	2	3	2	3	3	4	2	3	2	2	2.64
Overall Mean Score												**3.04**

Result: The Score for this Course is: **3.04** (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

Characterization of Distributed Systems: Introduction - Examples of distributed systems - Trends in distributed systems - Focus on resource sharing - Challenges - Case Study: The World Wide Web. **System Models:** Introduction - Physical models - Architectural models - Fundamental models. **(12 Hours)**

UNIT II

Networking and Internetworking: Introduction - Types of network - Network principles - Internet protocols - Case studies: Ethernet, WiFi and Bluetooth. **Inter process communication:** Introduction - API for the Internet protocols -External data representation and marshalling - Multicast communication -Network virtualization: Overlay networks - Case study: MPI. **(12 Hours)**

UNIT III

Distributed objects and components: Introduction - Distributed objects - Case study: CORBA - From objects to components - Case studies: Enterprise JavaBeans and Fractal. **Web Services:** Introduction - Web services - Service descriptions and IDL for web services -A directory service for use with web services - XML security - Coordination of web services - Application of web services. **(12 Hours)**

UNIT IV

Peer-to-peer systems: Introduction - Napster and its legacy - peer-to-peer middleware - Routing overlays - Overlay case studies: Pastry, Tapestry - Application case studies: Squirrel, OceanStore, Ivy. **Security:** Introduction - Overview of security techniques - Cryptographic algorithms - Digital signatures - Cryptography pragmatics. **Distributed File Systems:** Introduction - File service architecture - Case study: The sun network file system. **(12 Hours)**

UNIT V

Distributed Transactions: Introduction - Flat and nested distributed transactions - Atomic commit protocols - Concurrency control in distributed transactions - Distributed deadlocks - Transaction Recovery. **Replication:** Introduction - System model and role of group communication - Fault-tolerant services. **Distributed Multimedia Systems:** Introduction - Characteristics of multimedia data - Quality of service management - Stream adaptation - Resource Management. **(12 Hours)**

BOOK FOR STUDY:

- **"Distributed Systems Concepts and Design",** George Coulouris, Jean Dollimore, Tim Kindberg, Gordon Blair, Fifth Edition, Pearson India Education Services Pvt. Ltd, 2017.

UNIT I	**:**	Chapters	:	1 , 2
UNIT II	**:**	Chapters	:	3, 4
UNIT III	**:**	Chapters	:	8, 9
UNIT IV	**:**	Chapters	:	10, 11, 12
UNIT V	**:**	Chapters	:	17, 18, 20

BOOKS FOR REFERENCE:

1. **"Distributed Operating Systems",** Andrew S. Tanenbaum, Pearson Education, 2012.
2. "**Distributed Computing",** Sunitha Mahajan, Seema Shah, Second Edition, Oxford University Press, 2014.

MICROPROCESSOR - LAB

Semester: IV **Hours: 3**

Code : 20CS4CP04 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Demonstrate the programs on 8086 microprocessor.	PSO - 1	K
CO - 2	Perform the arithmetic operations with the microprocessor.	PSO - 1, PSO - 5	AP
CO - 3	Perform simple programs using assembly level language.	PSO - 2, PSO - 3	AP
CO - 4	Develop the assembly level programming using 8085 instruction set.	PSO - 4, PSO - 5	AP
CO - 5	Make use of different I/O interfacing with 8085 microprocessor.	PSO - 1, PSO - 5	AP

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

Semester: IV			**MICROPROCESSOR - LAB**						**Hours: 3**
Code : 20CS4CP04									**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	3	3	3	4	4	4	4	4	4	4	3.63
CO - 2	3	3	3	3	3	4	4	4	3	3	3	3.27
CO - 3	3	3	3	4	3	4	4	4	4	4	4	3.63
CO - 4	3	3	3	3	3	4	4	4	4	4	4	4
CO - 5	3	4	4	4	4	4	3	3	3	4	4	3.63
Overall Mean Score												**3.63**

Result: The Score for this Course is: **3.63** (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

I. Arithmetic Operations

1. Exchange the contents of memory locations 2000H and 4000H
2. Subtract the content of one memory location from other memory location.
3. Perform Subtraction for 8 bit and 16 bit Binary numbers.
4. Add the content of two memory locations.
5. Perform Addition for 8 bit and 16 bit Binary numbers.
6. Perform 8 bit Multiplication and 8 bit Division.

II. Packing and Unpacking

1. Pack the two unpacked BCD numbers stored in two memory locations and store result in another memory location.
2. Unpack a two digit BCD numbers and store the two digits in different memory locations.

III. Program with simple calculation

1. Write a program to sort given 10 numbers
2. Write a Program to add two Arrays

IV. Code Conversion

1. BCD to HEX and HEX to BCD
2. Binary to ASCII and ASCII to Binary

ANIMATION - LAB

Semester: IV **Hours: 2**

Code : 20CS4AP02 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Demonstrate the effective utilization of flash tool	PSO - 1	U
CO - 2	Exhibit the layer techniques for designing.	PSO - 2	AP
CO - 3	Execute the various types of tweening.	PSO - 2	AP
CO - 4	Apply the various animation techniques to animate text and create symbols.	PSO - 1, PSO - 2	AP
CO - 5	Build an animated short story using various techniques.	PSO - 2	C

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

Semester: IV			**ANIMATION - LAB**								**Hours: 2**
Code : 20CS4AP02											**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	3	2	4	5	3	3	2	3.55
CO - 2	5	5	3	3	4	3	4	5	3	3	2	3.64
CO - 3	5	5	4	3	3	2	5	5	3	2	2	3.55
CO - 4	5	5	4	2	3	3	4	5	4	3	3	3.73
CO - 5	5	4	4	3	4	2	4	5	3	3	3	3.64
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

1. Working with Tools
2. Working with Panels
3. Creating symbols
4. Frame by frame animation
5. Motion Tweening
6. Shape Tweening
7. Animating Text
8. Working with multiple layers
9. Working with Guide layers
10. Working with Mask layers
11. Short story creation with multiple scenes

WEB APPLICATION DEVELOPMENT

Semester: V **Hours: 4+1**

Code : 20CS5MC08 **Credits: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Discuss the basics of PHP and its advantages over other programming languages.	PSO - 1	K
CO - 2	Describe and use the features of PHP with variables, operators, flow control statements and arrays for developing web applications	PSO - 2	AP
CO - 3	Analyze the usage of PHP and MySQL in dynamic web development with error handling, securing & extending PHP.	PSO - 5	AN
CO - 4	Learn about controls for reading data in Web page.	PSO - 3	U
CO - 5	Implement the concept of database in PHP.	PSO - 5	AP

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

Semester: V				**WEB APPLICATION DEVELOPMENT**							**Hours: 4+1**
Code : 20CS5MC08											**Credits: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	3	3	3	3	4	4	3	3	3	3.27
CO - 2	4	3	3	3	3	3	4	4	3	3	4	3.36
CO - 3	4	3	3	4	3	3	4	4	3	3	3	3.36
CO - 4	4	3	3	4	3	3	4	4	3	3	4	3.45
CO - 5	5	3	3	4	4	4	5	5	3	4	4	4
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

ESSENTIAL PHP: Getting PHP - Creating your Development Environment - Creating a first PHP Page - Running Your first PHP page - Mixing HTML and PHP - Printing some text - printing some HTML - More Echo power - Using PHP ''here''- Command - Line PHP - Adding commands to PHP code - Working with Variables - Storing data in variables-interpolating strings - creating Variables and variables Creating Constants - Understanding PHP's Internal Data types - **Operators and Flow Control.** PHP's Math Operators - working with the Assignment operators - Incrementing and Decrementing Values - The PHP string Operators - The Bitwise Operators - The Execution Operator - PHP Operator Precedence - Using the if statement- The PHP Comparison Operators - The PHP Logical Operators - The Else statement - The elseif Statement - The ternary Operator - The Switch Statement - Using for Loop - Using While Loops - Using do ..While Loops - Using the foreach Loop- Terminating Loops Early. **(12 Hours)**

UNIT II

STRINGS AND ARRAYS: The String Functions- Converting to and from Strings - Formatting Text String - Building yourself some arrays - Modifying Data in Arrays- Deleting Array Elements - Handling Arrays with Loops - The PHP Array Functions - Converting Between Strings and Arrays using implode and explode - Extracting Data from Arrays - Sorting Arrays - Using PHP's Array Operators - Comparing Arrays to each other - Handling Multidimensional Arrays - Using Multidimensional Arrays in loops - Moving Through Arrays- Splitting and Merging Arrays.

(12 Hours)

UNIT III

CREATING FUNCTIONS: Creating Functions in PHP - Passing Functions Some Data- Passing Arrays to Functions - Passing by Reference - Using Default Arguments - Passing Variable Numbers of Arguments - Returning Data from functions - Returning Arrays - Returning References - Introducing Variables scope in PHP - Accessing Global Data - Working with static Variables - PHP Conditional Functions- PHP Conditional Functions - PHP Variables Functions - Nesting Functions. **(12 Hours)**

UNIT IV

READING DATA IN WEB PAGES: Setting up web pages to communication with PHP - Handling Text Fields - Handling Text Areas - Handling Check boxes- Handling Radio buttons - Handling List boxes - Handling Password Controls- Handling Hidden Controls - Handling Image Maps - Handling File Uploads - Handling Buttons. **(12 Hours)**

UNIT V

WORKING WITH DATABASES: Creating a MYSOL Database - Creating a New Table - Putting Data into the New Database - Accessing the Databases in PHP - Updating Databases - Inserting New Data Items into a Database - Deleting Records - Creating New Tables - Creating a New Database - Sorting your Data.

(12 Hours)

BOOK FOR STUDY

- **"The Complete Reference PHP",** Steven Holzner, Tata McGraw Hill Pvt. Ltd., 2013.

UNIT I	**:** Chapters :	1, 2
UNIT II	**:** Chapter :	3
UNIT III	**:** Chapter :	4
UNIT IV	**:** Chapter :	5
UNIT V	**:** Chapter :	10

BOOKS FOR REFERENCE:

1. **"Learning PHP, MySQL & JavaScript",** Robin Nixon, O'Reilly, Fourth Edition 2017.
2. "**PHP6 and MySQL 6 Bible**", Steve Suehring, Tim Converse and Joyce Park, Wiley India Pvt. Ltd., Reprint 2015.

DATABASE MANAGEMENT SYSTEMS

Semester: V **Hours: 4+1**

Code : 20CS5MC09 **Credits: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Learn the fundamental Concepts of relational Database, Structured Query Language and Data Modeling	PSO - 1, PSO - 2	K
CO - 2	Understand the logical design of the database using data modeling such as Entity Relationship diagrams and data normalization	PSO - 1, PSO - 2	U
CO - 3	Develop deep knowledge in SQL queries, sub-queries, functions, views, indexes, and queries	PSO - 2, PSO - 3	AP
CO - 4	Analyze and develop skills on aggregate functions, joins, unions, triggers and cursors	PSO - 2, PSO - 5	AP
CO - 5	Understand database Security and deal with e-transaction Management and control Concurrency	PSO - 1, PSO - 5	U

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

Semester: V				**DATABASE MANAGEMENT SYSTEMS**							**Hours: 4+1**
Code : 20CS5MC09											**Credits: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	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	3	3	3.91
CO - 4	5	4	5	4	3	3	5	5	5	3	3	4.09
CO - 5	5	4	5	4	3	3	5	5	5	3	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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I

Databases and Database Users: Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications - When Not to Use a DBMS - **Database System Concepts and Architecture:** Data Models, Schemas, and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems. **(15 Hours)**

UNIT II

Data Modeling Using the Entity-Relationship (ER) Model: Using High-Level Conceptual Data Models for Database Design - An Example Database Application - Entity Types, Entity Sets, Attributes, and Keys - Relationship Types, Relationship Sets, Roles, and Structural Constraints - Weak Entity Types - Refining the ER Design for the COMPANY Database - ER Diagrams, Naming Conventions, and Design Issues - **The Enhanced Entity-Relationship (EER) Model:** Subclasses, Superclasses, and Inheritance - Specialization and Generalization - Constraints and Characteristics of Specialization and Generalization Hierarchies - Modeling of UNION Types Using Categories - A Sample UNIVERSITY EER Schema, Design Choices and Formal Definitions - **The Relational Data Model and Relational Database Constraints:** Relational Model Concepts - Relational Model Constraints and Relational Database Schemas - Update Operations, Transactions, and Dealing with Constraint Violations. **(15 Hours)**

UNIT III

Basic SQL: SQL Data Definition and Data Types - Specifying Constraints in SQL - Basic Retrieval Queries in SQL - INSERT, DELETE and UPDATE Statements in SQL - Additional Features of SQL - **More SQL: Complex Queries, Triggers, Views, and Schema Modification:** More Complex SQL Queries -Specifying Constraints as Assertions and Triggers - Views in SQL - Schema Change Statements in SQL - **The Relational Algebra and Relational Calculus:** Unary Relational Operations: SELECT and PROJECT - Relational Algebra Operations from Set Theory - Binary Relational Operations: JOIN and DIVISION - Additional Relational Operations - Examples of Queries in Relational Algebra - The Tuple Relational Calculus - The Domain Relational Calculus. **(15 Hours)**

UNIT IV

Introduction to SQL Programming Techniques: Overview of Database Programming Techniques and Issues - Embedded SQL, Dynamic SQL, and SQLJ - Database Programming with Function Calls and Class - Libraries: SQL/CLI and JDBC - Database Stored Procedures and SQL/PSM - Comparing the Three Approaches - **Basics of Functional Dependencies and Normalization for Relational Databases:** Informal Design Guidelines for Relation Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms - Boyce - Codd Normal Form - Multivalued Dependency and Fourth Normal Form - Join Dependencies and Fifth Normal Form. **(15 Hours)**

UNIT V

Distributed Database Concepts: Distributed Database Concepts - Data Fragmentation, Replication, and Allocation Techniques for Distributed Database Design - Query Processing and Optimization in Distributed Databases - Types of Distributed Database Systems - Distributed Database Architectures - Distributed Catalog Management - **NOSQL Databases and Big Data Storage Systems:** Introduction to NOSQL Systems - The CAP Theorem - Document-Based NOSQL Systems and MongoDB - NOSQL Key-Value Stores - Column-Based or Wide Column NOSQL Systems - NOSQL Graph Databases and Neo4j - **Database Security:** Introduction to Database Security Issues - Discretionary Access Control Based on Granting and Revoking Privileges - Mandatory Access Control and Role-Based Access Control for Multilevel Security - SQL Injection - Introduction to Statistical Database Security - Introduction to Flow Control - Encryption and Public Key Infrastructures - Privacy Issues and Preservation - Challenges to Maintaining Database Security - Oracle Label-Based Security. **(15 Hours)**

BOOK FOR STUDY:

- **"Fundamentals of Database Systems",** Global Edition, Ramez Elmasri, Shamkant B. Navathe, Pearson Publications, Seventh Edition, 2017.

UNIT I	**:**	Chapters :1.1 - 1.8, 2.1 - 2.6
UNIT II	**:**	Chapters :3.1 - 3.7, 4.1 - 4.5, 5
UNIT III	**:**	Chapters :6 - 8
UNIT IV	**:**	Chapters :10,14
UNIT V	**:**	Chapters :23.1, 23.2, 23.5 - 23.8, 24,30

BOOKS FOR REFERENCE:

1. **"Database System Concepts",** Abraham SillberSchatz, Hendry F. Korth, S. Sundrashan, 6th Edition, The McGraw-Hill Companies, 2013.
2. **"Database Systems: Models, Languages, Design and Application Programming",** Ramez Elmasri and Shamkant Navathe, Pearson Education, Sixth Edition, 2014**.**

OPERATING SYSTEMS

Semester: V **Hours: 4**

Code : 20CS5MC10 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire fundamental knowledge of Operating System.	PSO - 1	K
CO - 2	Discuss the concurrency in synchronization, deadlock and the mechanism to manage avoid in multiprogramming system	PSO - 2	AP
CO - 3	Demonstrate memory management along with issues and challenges in it.	PSO - 4	AP
CO - 4	Obtain the knowledge of Uniprocessor Scheduling.	PSO - 3	K
CO - 5	Identify the security techniques to protect the system from threats and attacks.	PSO - 5	U

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

Semester: V			**OPERATING SYSTEMS**								**Hours: 4**
Code : 20CS5MC10											**Credits: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	3	3	4	3	4	4	3	4	3	3.45
CO - 2	4	3	3	3	3	3	4	4	3	3	4	3.36
CO - 3	4	3	3	4	4	3	4	4	3	4	3	3.55
CO - 4	4	3	3	4	3	3	4	4	3	3	4	3.45
CO - 5	5	3	3	4	4	4	5	5	3	4	4	4.00
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

Operating System Overview: Operating System Objectives and functions - The Evolution of Operating System - Major Achievements - Microsoft Windows Overview - Traditional/Unix Systems - Modern UNIX System - Linux. **Process Description and Control:** Process - Process States - Process Description - Process Control. **(12 Hours)**

UNIT II

Concurrency: Mutual Exclusion and Synchronization: Principles of Concurrency - Mutual Exclusion: Hardware Support - Semaphores - Message Passing - Readers/Writers Problem. **Concurrency: Deadlock and Starvation:** Principles of Deadlock - Deadlock Prevention - Deadlock Avoidance - Deadlock Detection - An Integrated Deadlock Strategy - Dining Philosophers Problem.

(12 Hours)

UNIT III

Memory Management: Memory management requirements - Memory Partitioning-Paging - Segmentation. **Virtual Memory:** Hardware and Control Structures - Operating System Software. **(12 Hours)**

UNIT IV

Uniprocessor Scheduling: Types of Processor Scheduling - Scheduling Algorithms. **Multiprocessor and Real Time Scheduling:** Multiprocessor Scheduling - Real Time Scheduling. **I/O Management and Disk Scheduling:** I/O Devices - Organization of the I/O Function - Disk Scheduling. **(12 Hours)**

UNIT V

File Management: Overview - File Organization and Access - B-Trees - File Directories - File Sharing - Record Blocking - Secondary Storage Management. **Computer Security Threats:** Computer Security Concepts - Threats, Attacks, and Assets - Intruders - Malicious Software Overview - Viruses, Worms and Bots - Rootkits. **(12 Hours)**

BOOK FOR STUDY:

- **"Operating Systems Internals and Design Principles",** William Stallings. Pearson Education Pvt Ltd., 7th Edition, 2014.

UNIT I:		Chapters	: 1.1 - 1.3, 1.7 - 1.10, 2.1 - 2.4
UNIT II	**:**	Chapters	: 4.1 - 4.3, 4.5, 4.6, 5.1 - 5.6
UNIT III	**:**	Chapters	: 6.1 - 6.4, 7.1 - 7.2
UNIT IV	**:**	Chapters	: 8.1 - 8.2, 9.1 - 9.2, 10.1 - 10.2, 10.5
UNIT V	**:**	Chapters	: 11.1 - 11.7, 13.1 - 13.6

BOOKS FOR REFERENCE:

1. **"Operating System",** Harvey M. Deitel, Paul J. Deitel, David R. Choffness, Pearson Education, 3rd Edition, Tenth Impression, 2013.
2. **"Operating System Concepts",** Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Wiley India (P) Ltd, 8th Edition, 2017.

SOFTWARE ENGINEERING

Semester: V **Hours: 4**

Code : 20CS5DE3A **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Explain the software engineering process and project management	PSO-1	K
CO - 2	Demonstrate software requirements and analysis	PSO-5	AN
CO - 3	Outline the software design process and user interface	PSO-3	AN
CO - 4	Compare and contrast various software testing methods	PSO-5	U
CO - 5	Discuss about the software integration and project management	PSO-5	AN

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

Semester: V			**SOFTWARE ENGINEERING**					**Hours: 4**
Code : 20CS5DE3A								**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	3	3	3	3	3	4	4	4	4	4	3.45
CO - 2	3	3	3	3	3	3	4	4	3	3	3	3.18
CO - 3	3	3	3	3	3	3	4	4	4	4	4	3.45
CO - 4	3	3	3	3	3	3	4	4	4	4	4	3.45
CO - 5	4	4	4	4	4	4	3	3	3	4	4	3.72
Overall Mean Score												**3.45**

Result: The Score for this Course is: **3.45** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Introduction: Software Development Projects - Emergence of Software Engineering. **Software Life Cycle Models**: A Few Basic Concepts - Waterfall Model and its Extensions - Rapid Application Development (RAD) - Agile Development Models - Spiral Model - A Comparison of Different Life Cycle Models. **(12 Hours)**

UNIT II

Software Project Management: Software Project Management Complexities - Project Planning - Metrics for Project Size Estimation - Project Estimation Techniques - Empirical Estimation Techniques - COCOMO-A Heuristic Estimation Technique - Staffing Level Estimation - Scheduling - Organisation and Team Structures - Staffing - Risk Management - Software Configuration Management. **(12 Hours)**

UNIT III

Requirements Analysis and Specification: Requirements Gathering and Analysis - Software Requirements Specification (SRS). **Software Design**: Overview of the Design Process - Cohesion and Coupling - Layered Arrangement of Modules - Approaches to Software Design. **Function Oriented Software Design**: Structured Analysis - Developing the DFD Model of a System - Structured Design - Detailed Design - Design Review. **(12 Hours)**

UNIT IV

User Interface Design: Basic Concepts - Types of User Interfaces - A User Interface Design Methodology. **Coding and Testing**: Coding - Code Review - Software Documentation - Testing - Unit Testing - Black-Box Testing - White-Box Testing - Debugging - Program Analysis Tools - Integration Testing - Testing Object Oriented Programs - System Testing - Some General Issues Associated with Testing. **(12 Hours)**

UNIT V

Software Reliability and Quality Management: Software Reliability - Statistical Testing - Software Quality - Software Quality Management System - ISO 9000 - SEI Capability Maturity Model - Few Other Important Quality Standards - Six Sigma. **Software Maintenance**: Characteristics of Software Maintenance - Software Reverse Engineering - Software Maintenance Process Models - Estimation of Maintenance Cost. **(12 Hours)**

BOOK FOR STUDY:

- **"Fundamentals of Software Engineering",** Rajib Mall, PHI Learning Private Limited, Delhi, Fifth Edition, 2019.

UNIT I	**:**	Chapters	: 1.2, 1.4, 2
UNIT II	**:**	Chapter	: 3
UNIT III	**:**	Chapters	: 4.1,4.2, 5.1, 5.3 - 5.5,6.2 - 6.6
UNIT IV	**:**	Chapters	: 9.2, 9.3, 9.5, 10.1 - 10.12
UNIT V	**:**	Chapters	: 11,13

BOOKS FOR REFERENCE:

1. **"Software Engineering",** Ian Sommer Ville, Pearson Education, Nineth Edition, 2017.
2. **"Software Engineering a Practitioners Approach",** Roger S. Pressman, McGraw Hill International Edition, Seventh Edition, 2017

SYSTEM MODELING AND SIMULATION

Semester: V **Hours: 4**

Code : 20CS5DE3B **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand the concept of simulation, the fundamental logic, structure, Components, types of simulation models.	PSO - 1	K
CO - 2	Develop solutions for application problems using manual simulation and Time Advance algorithm on discrete event simulation.	PSO - 2	AP
CO - 3	Understand the concepts of Statistical models and queuing models.	PSO - 1, PSO - 3	U
CO - 4	Analyse the useful model of input data, absolute performance and estimation with respect to output analysis, model building, verification, calibration, validation of models and optimization.	PSO - 2	AN
CO - 5	Apply acceptance rejection technique and inverse transform technique to generate Random Variates and Random numbers using LCM.	PSO - 2, PSO - 3	AP

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

Semester: V			**SYSTEM MODELING AND SIMULATION**								**Hours: 4**
Code : 20CS5DE3B											**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	3	2	3	4	3	5	4	3	4	4	3.45
CO - 2	4	3	2	4	3	2	4	3	3	4	3	3.18
CO - 3	4	3	3	2	3	3	3	4	3	3	4	3.18
CO - 4	3	3	2	3	3	3	4	3	4	5	3	3.27
CO - 5	3	3	3	4	3	3	4	4	3	3	2	3.18
Overall Mean Score												**3.25**

Result: The Score for this Course is: **3.25** (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

Basic Simulation Modeling: The Nature of Simulation - Systems, Models, and Simulation - Discrete-Event Simulation - Simulation Model - Simulation of an Inventory System - Parallel/Distributed Simulation and the High Level Architecture - Steps in a Sound Simulation Study - Advantages, Disadvantages, and Pitfalls of Simulation. **(12 Hours)**

UNIT II

Modeling Complex Systems: List Processing in Simulation - A Simple Simulation Language: simlib - Single-Server Queueing Simulation with simlib - Time-Shared Computer Model - Multiteller Bank with Jockeying - Job-Shop Model - Efficient Event-List Management. **(12 Hours)**

UNIT III

Review of Basic Probability and Statistics: Random Variables and Their Properties - Simulation Output Data and Stochastic Processes - Estimation of Means, Variances, and Correlations - Confidence Intervals and Hypothesis Tests for the Mean - The Strong Law of Large Numbers - The Danger of Replacing a Probability Distribution by its Mean - **Building Valid, Credible, and Appropriately Detailed Simulation Models**: Introduction and Definitions - Guidelines for Determining the Level of Model Detail - Verification of Simulation Computer Programs - Techniques for Increasing Model Validity and Credibility. **(12 Hours)**

UNIT IV

Selecting Input Probability Distributions: Introduction - Useful Probability Distributions -Techniques for Assessing Sample Independence - The ExpertFit Software and an Extended Example - Shifted and Truncated Distributions - Bézier Distributions - Specifying Multivariate Distributions, Correlations and Stochastic Processes - Selecting a Distribution in the Absence of Data - Models of Arrival Processes - Assessing the Homogeneity of Different Data Sets. **(12 Hours)**

UNIT V

Random-Number Generators: Introduction - Linear Congruential Generators - Other Kinds of Generators - Testing Random-Number Generators. **(12 Hours)**

BOOK FOR STUDY:

- **"Simulation Modeling and Analysis",** by Averill M. Law McGraw-Hill Education Fifth Edition, 2015

UNIT I	:	Chapter	:	1
UNIT II	:	Chapter	:	2
UNIT III	:	Chapters	:	4, 5.1- 5.4
UNIT IV	:	Chapter	:	6.1 - 6.3, 6.7 - 6.13
UNIT V	:	Chapter	:	7

BOOKS FOR REFERENCES:

1. **"Modeling and Simulation",** Pushpa Singh and Narendra Singh, S. K. Kataria and Sons Publication, Reprint 2012 Edition.
2. **"Computer Simulation and Modeling",** Mahalakshmi Sridhar, Technical Publications, 2016.

BLOCKCHAIN TECHNOLOGY

Semester: V **Hours: 4**

Code : 20CS5DE3C **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain basic knowledge on Centralized vs. Decentralized Systems and Importance of Blockchain.	PSO - 1	K
CO - 2	Master at a high level Blockchain Foundation and Game Theory.	PSO - 2	AP
CO - 3	Understand how Bitcoin Cryptocurrency works in practice.	PSO - 1, PSO - 3	U
CO - 4	Familiarize with Ethereum and deploy Smart Contracts.	PSO - 2	AN
CO - 5	Exploit applications of Blockchain in real word sceneries.	PSO - 2, PSO - 3	AP

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

Semester: V			**BLOCKCHAIN TECHNOLOGY**								**Hours: 4**
Code : 20CS5DE3C											**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	2	2	2	2	4	5	2	2	3	2.64
CO - 2	4	2	5	2	2	2	4	4	4	2	2	3.00
CO - 3	5	4	3	2	4	3	5	4	5	3	2	3.64
CO - 4	3	4	3	3	3	2	4	3	5	3	2	3.18
CO - 5	3	4	3	2	4	2	3	4	4	4	3	3.27
Overall Mean Score												**3.15**

Result: The Score for this Course is: **3.15** (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 Blockchain: Backstory of Blockchain - What is Blockchain? - Centralized vs. Decentralized Systems - Layers of Blockchain - Why is Blockchain Important? - Blockchain Uses and Use Cases **(12 Hours)**

UNIT II

How Blockchain Works: Laying the Blockchain Foundation - Cryptography - Game Theory - Computer Science Engineering - Putting It All Together - Blockchain Applications - Scaling Blockchain **(12 Hours)**

UNIT III

How Bitcoin Works: The History of Money - Dawn of Bitcoin - The Bitcoin Blockchain - The Bitcoin Network - Bitcoin Scripts - Full Nodes vs. SPVs - Bitcoin Wallets **(12 Hours)**

UNIT IV

How Ethereum Works: From Bitcoin to Ethereum - Enter the Ethereum Blockchain - Ethereum Smart Contracts - Ethereum Virtual Machine and Code Execution - Ethereum Ecosystem **(12 Hours)**

UNIT V

Blockchain Application Development: Decentralized Applications - Interacting with the Bitcoin Blockchain - Interacting Programmatically with Ethereum-Sending Transactions - Interacting Programmatically with Ethereum-Creating a Smart Contract - Interacting Programmatically with Ethereum-Executing Smart Contract Functions - Blockchain Concepts Revisited - Public vs. Private Blockchains - Decentralized Application Architecture **(12 Hours)**

BOOK FOR STUDY:

- **"Beginning Blockchain - A Beginner's Guide to Building Blockchain Solutions",** Bikramaditya Singhal, Gautam Dhameja, Priyansu Sekhar Panda, Apress, Bangalore, Karnataka, India, 2018.

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

BOOKS FOR REFERENCE

1. **Mastering Blockchain: Distributed Ledger Technology, Decentralization, and Smart Contracts Explained,** Imran Bashir, Second Edition, Packt Publishing, 2018.
2. **Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction,** Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Princeton University Press (July 19, 2016).

WEB APPLICATION DEVELOPMENT - LAB

Semester: V **Hours: 5**

Code : 20CS5CP05 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Develop simple web application in PHP	PSO - 1	AP
CO - 2	Implement string and array and user defined function in Web application	PSO - 2	AP
CO - 3	Acquire knowledge and skills for creating Home page.	PSO - 4	AP
CO - 4	Create web form and use POST method in PHP.	PSO - 3	C
CO - 5	Develop web applications to implement database concept.	PSO - 5	AP

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

Semester: V			**WEB APPLICATION DEVELOPMENT - LAB**								**Hours: 5**
Code : 20CS5CP05											**Credits: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	4	3	4	3	5	5	4	3	4	4	3.81
CO - 2	4	4	3	5	3	4	3	3	3	4	5	3.72
CO - 3	3	4	4	4	3	5	5	4	3	3	4	3.81
CO - 4	3	4	4	4	3	5	4	4	3	3	4	3.72
CO - 5	4	3	3	4	4	4	4	4	3	3	4	3.63
Overall Mean Score												**3.73**

Result: The Score for this Course is: **3.73** (High Relationship)

Note:

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

Values Scaling:

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

1. Creating simple webpage using PHP.
2. Use of conditional statements in PHP.
3. Use of looping statements in PHP.
4. Creating different types of arrays.
5. Usage of array functions.
6. Creating user defined functions.
7. Creation of files.
8. File manipulation using PHP.
9. Create a Home Page using PHP
10. Form creation using POST and GET methods
11. Database Operations
12. Login form creation
13. Student mark list creation
14. Electricity bill preparation.

DATABASE MANAGEMENT SYSTEMES - LAB

Semester: V **Hours: 5**

Code : 20CS5CP06 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Execute the common SQL queries for DDL, DML and DCL operations	PSO - 1, PSO - 2	AP
CO - 2	Evaluate the Aggregate and Group functions with practical examples	PSO - 2, PSO - 3	AN
CO - 3	Design different tables and apply embedded and nested queries	PSO - 2, PSO - 3	C
CO - 4	Analyze and apply queries to retrieve information from a data base	PSO - 2, PSO - 5	AP
CO - 5	Construct real life applications and implement a database.	PSO - 2, PSO - 4	C

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

Semester: V			**DATABASE MANAGEMENT SYSTEMES - LAB**								**Hours: 5**
Code : 20CS5CP06											**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	5	5	4	2	2	2	4	4	5	4	2	3.55
CO - 2	5	5	5	2	2	2	4	4	5	3	2	3.55
CO - 3	5	4	4	2	2	2	5	4	5	4	2	3.55
CO - 4	5	5	5	2	2	2	4	5	5	4	2	3.73
CO - 5	4	5	5	2	2	2	4	5	4	5	4	3.82
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 = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

1. Working with DDL, DML and TCL Commands.
2. Retrieving rows with logical, comparison, conjunctive and arithmetic Operators
3. Retrieving rows and columns with relational and special operators
4. Retrieving rows with Character, Number and Date functions.
5. Working with Aggregate functions.
6. Working with group function
7. Join Operation & Sub queries
8. Working with Sequence and Index
9. Working with Views
10. Simple PL/SQL programs
11. Working with stored procedures
12. Working with functions
13. Working with Triggers
14. Exception handling
15. Working with implicit and explicit cursor.

WEB DESIGNING - LAB

Semester: V **Hours: 2**

Code : 20CS5GE01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain the fundamental knowledge of HTML tags.	PSO - 1	K
CO - 2	Create web pages using image, tables and frames.	PSO - 1	K2
CO - 3	Explore DHTML and text effects in creating web pages.	PSO - 1	AP
CO - 4	Design an interactive website using HTML tags, personal web pages using style sheets.	PSO - 2	AP
CO - 5	Construct a dynamic website using HTML Tags.	PSO - 5	AP

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

Semester: V				**WEB DESIGNING - LAB**							**Hours: 2**
Code : 20CS5GE01											**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	5	5	5	3	4	2	5	5	3	3	2	3.82
CO - 2	5	4	5	3	3	3	5	5	4	3	2	3.82
CO - 3	5	4	4	2	3	2	5	5	3	3	3	3.55
CO - 4	5	4	5	2	3	2	5	5	4	3	3	3.73
CO - 5	4	3	4	2	3	3	4	5	3	3	3	3.36
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 = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

1. Simple Web Page using all Formatting
2. Web Page with Hyper Links and Images
3. Web Page with Lists
4. Web Page with Table
5. Web Page with Frames
6. Application Form Creation
7. Resume Preparation using images
8. Dynamic Website Creation (College, Department)
9. Personal Webpage creation using Style Sheets
10. Webpage creation using JavaScript

GENERIC ELECTIVE (NME)

NATIONAL CADET CORPS

PROGRAMME OUTCOMES (PO)

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, 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

GENERIC ELECTIVE (NME)

Sem.	Part	Code	Title of Paper	Hours	Credits
V	IV	20GE5NC01	NCC - National Integration and Personality Development	2	2
VI	IV	20GE6NC02	NCC- Organization and Health Programme in NCC	2	2

INTERNAL COMPONENTS

Internal - I	:	30 marks
Internal - II	:	30 marks
Component - I	:	10 marks
Component - II	:	10 marks
Component - III	:	10 marks
Component - IV	:	10 marks
Total	**:**	**100 marks**

NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT

Semester: V **Hours: 2**

Code : 20GE5NC01 **Credits: 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 - 1,PSO - 2, PSO - 4	K, An, Ap,
CO - 2	Perceive the importance of Weapon training is to remove the fear of a weapon from the hearts of youth.	PSO - 1, PSO - 4	K, An, C
CO - 3	Comprehend the motivation for positive attitude, character building and personality development.	PSO - 2,PSO - 3, PSO 4, PSO - 5	K, S, Ap
CO - 4	Analyze the different types of disasters under different circumstances.	PSO - 4, PSO - 5	K, An, E
CO - 5	Achieve practical knowledge in community development and other social programmes.	PSO - 1, PSO - 2	K, Ap, S, E

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

Semester: V				**NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT**							**Hours: 2**
Code : 20GE5NC01											**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	5	3	3	2	2	4	5	4	3	3	5	3.55
CO - 2	5	4	4	2	3	4	5	4	4	4	5	4.00
CO - 3	5	5	4	2	2	3	3	5	3	3	4	4.00
CO - 4	5	4	3	2	2	4	4	5	4	4	5	3.82
CO - 5	5	4	4	2	3	3	5	4	2	5	4	3.73
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 = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I: NATIONAL INTEGRATION

Motto of National Integration - Importance of National Integration Culture and heritage of Tamil Nadu. **(6 Hours)**

UNIT II: CIVIL AFFAIRS

Aim of aid to civil authority - Role of NCC Cadets during natural calamities - Types of disaster - Essential services during natural calamities **(6 Hours)**

UNIT III: CIVIL DEFENCE AND SELF DEFENCE

Civil Defence - Organization - Aims and services - Aid to Civil authorities in emergency - Self Defence -Aims of Self Defence - Women and Self Defence **(6 Hours)**

UNI IV: LEADERSHIP AND PERSONALITY DEVELOPMENT

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 . **(6 Hours)**

UNIT V: SOFT SKILLS

Soft skills - interview skill - influencing skill - social skill - communication skill - self motivation - self esteem - body language. **(6 Hours)**

BOOK FOR REFERENCE:

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

INTERNAL QUESTION PATTERN

Time: 2 hours **Marks: 30**

PART - A

Answer Any 4 out of five $4 \times 2 = 8$

PART- B

Two either or questions (one from each) $2 \times 4 = 8$

PART - C

Two either or questions (one from each $2 \times 7 = 14$

SKILL ENHANCEMENT COMPULSORY COURSE
APTITUDE BUILDING - I

Semester: V **Hours: 2**

Code : 20SE5AB03 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain knowledge about operations on numbers and develop skills in problem solving	PSO - 3	K, A, E
CO - 2	Enhance their reasoning capacity	PSO - 3	K, A, E
CO - 3	Improve their reading, writing and speaking skills	PSO - 5	K, A, E
CO - 4	Recognize the importance of computer literacy	PSO - 5	K, A, E
CO - 5	Appear for competitive exams	PSO - 5	K, A, E

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

Semester: V				**APTITUDE BUILDING - I**							**Hours: 2**
Code : 20SE5AB03											**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	5	5	5	5	3	2	3	3	2	5	3.90
CO-2	5	5	5	5	5	3	2	3	3	2	5	3.90
CO-3	5	5	5	5	5	3	2	3	3	2	5	3.90
CO-4	5	5	5	5	5	3	2	3	3	2	5	3.90
CO-5	5	5	5	5	5	3	2	3	3	2	5	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

Numerical Ability: Numbers - Highest common factor & Least common multiple of numbers - average - problems on numbers - percentages - problems on ages - percentage - profit and loss - ratio and proportion - time & work

UNIT II

Reasoning: Series completion - analogy - coding & decoding - puzzle test - direction sense test - alphabet test - alpha - numeric sequence puzzle - arithmetic reasoning - inserting missing character - logical sequence of words.

UNIT III

English Language: Spotting errors - Articles - Tenses - Nouns - Pronouns - Adjectives - adverbs - Prepositions - Selecting the most suitable word - Synonyms - Antonyms - Spell check - Double blanks in a sentence.

UNIT IV

General Knowledge: Computer awareness - Classification - Elements of computing process - Programming languages - Computer memory - Software & Hardware - Operating systems - banking awareness - Banking Regulation Act - Reserve Bank of India - Commercial banks - e-banking, Currency system - Money market - Banking and Finance - Indian Monetary Policy.

UNIT V

Current Affairs: National & International Current Affairs - Economy - Sports - Science & Technology - Polity.

COURSE BOOK:

- I. Maria Jesili, Aptitude Building-I A book for Competitive examination, Vol.1, ACCA, Press, J.A. College, Periyakulam.

SKILL ENHANCEMENT COMPULSORY COURSE - APTITUDE BUILDING - I

COMPONENTS OF CIA

Continuous Internal Assessment Component (CIA)

Theory:

Component	Marks
Internal test I	40
Internal test II	40
Mock Interview	15
Attendance	5
Total	**100**

Component	Marks
Logical Reasoning	10
Numerical Aptitude	10
English Language	10
General Knowledge	10
Total	**40**

APTITUE BUILDING I - 20SE5AB03

QUESTION PATTERN

[Internal Examination Only]

MAXIMUM: 80 MARKS **TIME: 1 ½ HOURS**

Section	Type of Question	No. of Questions	No. of Questions to be answered	Marks for each question	Total
A Q.No. (1- 20)	MCQ Questions from Numerical Aptitude	20	20	1	20
B Q.No.(21- 40)	MCQ Questions from Reasoning	20	20	1	20
C Q.No. (41- 60)	MCQ Questions from English Language	20	20	1	20
D Q.No. (61- 80)	General knowledge & Current Affairs	20	20	1	20
Total					**80**

* **OMR** Sheet shall be provided for the examination.

INTERNSHIP CUM MINI PROJECT

Semester: V

Code : 20CS5MP01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire practical knowledge within the chosen area of technology for project development.	PSO - 2	AP
CO - 2	Apply knowledge of computing and information technologies to produce effective designs and solutions for specific computer-based problems.	PSO - 2, PSO - 4	AP
CO - 3	Identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach.	PSO - 2, PSO - 5	AN
CO - 4	Describe the impact upon society of computers, and the technical and human aspects of this impact.	PSO - 3, PSO - 4	AP
CO - 5	Effectively communicate during project development and present results for the area of concentration.	PSO - 5	AP

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

Semester: V				**INTERNSHIP CUM MINI PROJECT**							**Credits: 2**
Code : 20CS5MP01											
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	4	2	2	4	4	4	4	3	4	3.55
CO - 2	4	4	4	2	2	3	4	4	4	3	4	3.45
CO - 3	4	4	4	2	2	2	4	3	3	3	4	3.18
CO - 4	4	4	4	2	2	2	5	4	4	3	4	3.45
CO - 5	4	4	4	2	2	3	4	4	4	4	5	3.64
Overall Mean Score												**3.45**

Result: The Score for this Course is: **3.45** (High Relationship)

Note:

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

Values Scaling:

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

SOFTWARE TESTING

Semester: V

Code : 20CS5SS01 **Credits: 2***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the basic knowledge of testing and SDLC.	PSO - 1	K
CO - 2	Evaluate the system with various testing techniques and strategies.	PSO - 3	AN
CO - 3	Apply various testing techniques, including domain, code, fault, usage and model-based.	PSO - 3	AP
CO - 4	Execute program and test evaluations.	PSO - 2, PSO - 4	AP
CO - 5	Apply the software testing techniques in commercial environment	PSO - 2, PSO - 5	AP

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

Semester: V				**SOFTWARE TESTING**							**Credits: 2***
Code : 20CS5SS01											
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	3	4	4	4	4	4	3.45
CO - 2	4	4	4	4	4	4	4	3	3	2	4	3.60
CO - 3	3	3	3	3	3	3	4	3	3	2	4	3.09
CO - 4	3	3	3	3	3	3	4	3	3	3	4	3.18
CO - 5	3	3	3	3	3	3	4	4	4	4	4	3.45
Overall Mean Score												**3.35**

Result: The Score for this Course is: **3.35** (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 Testing, Software Development Life Cycle Models - Phases of Software Project - Quality, Quality Assurances and Quality Control - Testing, Verification and Validation - Process Model to represent Different Phases - Life Cycle Models.

UNIT II

Types of Testing. White Box Testing - What is White Box Testing - Static Testing - Structural Testing - Challenges in White Box Testing - **Black Box Testing:** What is Black Box Testing - Why Black box testing - When to do Black box testing - How to do Black box testing - **Integration Testing**: What is Integration Testing - Integration Testing as a type of Testing - Integration Testing as a phase of Testing - Scenario Testing - Defect Bash.

UNIT III

System and Acceptance Testing. System Testing Overview - Why is System Testing done? - Functional Versus Non-Functional Testing - Functional System Testing - Non-Functional Testing - Acceptance Testing - Summary of Testing Phases - **Performance Testing:** Introduction - Factors Governing Performance Testing - Methodology for Performance Testing - Tools for Performance Testing - Process for Performance Testing - Challenges**.**

UNIT IV

Testing of Object-Oriented Systems: Introduction - Primer on Object - Oriented Software - Differences in OO Testing - **Usability and Accessibility Testing. Common People Issues**: Perceptions and Misconceptions about Testing - Comparison Between Testing and Development Functions - Providing Career paths for Testing Professionals - The Role of the Ecosystem and a call for Action.

UNIT V

Organization Structures for Testing Teams: Dimensions of Organization Structures - Structures in Single - Product Companies - Structures for Multi-Product Companies - Effects of Globalization and Geographically Distributed Teams on Product Testing - Testing Services Organizations - Success Factors for Testing Organization - **Test Planning, Management, Execution, and Reporting:** Test Reporting - Best Practices.

BOOK FOR STUDY:

- **"Software Testing: Principles and Practices",** Srinivasan Desikan and Gopalaswamy Ramesh, Pearson Education, 2011.

UNIT I	**:**	Chapters	: 1, 2
UNIT II	**:**	Chapters	: 3, 4, 5
UNIT III	**:**	Chapters	: 6, 7
UNIT IV	**:**	Chapters	: 11, 12, 13
UNIT V	**:**	Chapters	: 14, 15.5, 15.6

BOOKS FOR REFERENCE:

1. **"Software Testing Techniques",** Boris Beizer, Dreamtech Publications, New Delhi- 2003.
2. **"Software Testing: Effective Methods, Tools and Techniques",** Renu Rajani and Pradeep Oak, Tata-McGraw-Hill Publishing Company Limited, 2008.

GREEN COMPUTING

Semester: V
Code : 20CS5SS02 **Credits: 2***
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the basic concepts of Environment Impacts of IT Green Software	PSO - 1	K
CO - 2	understand green (power-efficient) technologies for components of one single computer, such as CPU, memory and disk, and appreciate cutting edge designs for these components	PSO - 3	AN
CO - 3	Explain the basics of a variety of technologies applied in building a green system and various strategies in green IT	PSO - 3	AP
CO - 4	Identify the various key sustainability and green IT trends	PSO - 2, PSO - 4	AP
CO - 5	Discuss the various laws, standards and protocols for regulating green IT and use a range of tools to help monitor and design green systems	PSO - 2, PSO - 5	AP

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

Semester: V				GREEN COMPUTING								Credits: 2*
Code : 20CS5SS02												
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	2	4	3	4	5	4	3	3	3.63
CO - 2	4	5	3	3	3	4	4	5	3	3	2	3.18
CO - 3	4	3	3	2	3	3	4	4	5	3	4	3.45
CO - 4	3	3	3	2	5	2	3	3	4	5	4	3.36
CO - 5	3	5	3	3	4	3	4	3	4	3	3	3.45
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 = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos= Total of Mean Scores / Total No. of Cos

UNIT I

Green IT: An Overview: Introduction - Environmental Concerns and Sustainable Development - Environmental Impacts of IT - Green IT - Holistic Approach to Greening IT - Greening IT - Applying IT for Enhancing Environmental Sustainability - Green IT Standards and Eco-Labelling of IT - Enterprise Green IT Strategy - Green IT: Burden or Opportunity? - **Green Devices and Hardware:** Introduction - Life Cycle of a Device or Hardware - Reuse, Recycle and Dispose - **Green Software:** Introduction - Energy-Saving Software Techniques - Evaluating and Measuring Software Impact to Platform Power.

UNIT II

Sustainable Software Development: Introduction - Current Practices - Sustainable Software - Software Sustainability Attributes - Software Sustainability Metrics - Sustainable Software Methodology - Defining Actions - Case Study - **Green Data Centres:** Data Centres and Associated Energy Challenges - Data Centre IT Infrastructure - Data Centre Facility Infrastructure: Implications for Energy Efficiency - IT Infrastructure Management - Green Data Centre Metrics - Data Centre Management Strategies: A Case Study.

UNIT III

Green Data Storage: Introduction - Storage Media Power Characteristics - Energy Management Techniques for Hard Disks - System-Level Energy Management - **Green Networks and Communications:** Introduction - Objectives of Green Network Protocols - Green Network Protocols and Standards - **Enterprise Green IT Strategy:** Approaching Green IT Strategies - Business Drivers of Green IT Strategy - Business Dimensions for Green IT Transformation - Organizational Considerations in a Green IT Strategy - Steps in Developing a Green IT Strategy - Metrics and Measurements in Green Strategies.

UNIT IV

Sustainable Information Systems and Green Metrics: Introduction - Multilevel Sustainable Information - Sustainability Hierarchy Models - Product Level Information - Individual Level Information - Functional Level Information - Organizational Level Information - Measuring the Maturity of Sustainable ICT - **Enterprise Green IT Readiness:** Background: Readiness and Capability - Development of the G-Readiness Framework - Measuring an Organization's G-Readiness - **Green Enterprises and the Role of IT:** Organizational and Enterprise Greening - Information Systems in Greening Enterprises - Greening the Enterprise: IT Usage and Hardware - Inter-organizational Enterprise Activities and Green Issues - Enablers and Making the Case for IT and the Green Enterprise.

UNIT V

Managing Green IT: Introduction - Strategizing Green Initiatives - Implementation of Green IT - Information Assurance - Communication and Social Media - **Regulating Green IT:** Laws, Standards and Protocols: Introduction - The Regulatory Environment and IT Manufacturers - Nonregulatory Government Initiatives - Industry Associations and Standards Bodies - Green Building Standards - Green Data Centres - Social Movements and Greenpeace.

BOOK FOR STUDY:

- **"Harnessing Green it Principles and Practices",** San Murugesan and G.R. Gangadharan, John Wiley & Sons Ltd. Publication, 2012.

UNIT I: Chapters : 1 - 3

UNIT II : Chapters : 4, 5

UNIT III : Chapters : 6 - 8

UNIT IV : Chapters : 9, 10

UNIT V : Chapters : 14 - 16

BOOKS FOR REFERENCE:

1. **"Green IT Strategies and Applications-Using Environmental Intelligence",** Bhuvan Unhelkar, CRC Press, 2014.
2. **"Green Home computing for dummies",** Woody Leonhard and Katherine Murray, 2012.

XML AND WEB SERVICES

Semester: V
Code : 20CS5SS03 **Credits: 2***
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Explain the concept of service oriented architecture	PSO - 1	K
CO - 2	Develop a simple XML application	PSO - 2	AP
CO - 3	Explain the design principles and application of SOAP based Web Services.	PSO - 1, PSO - 3	U
CO - 4	Elaborate the key technologies in web services.	PSO - 2	AN
CO - 5	Apply the security issues in XML.	PSO - 2, PSO - 3	AP

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

Semester: V			**XML AND WEB SERVICES**						**Credits: 2***			
Code : 20CS5SS03												
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	2	2	3	2	2	5	4	2	2	3	2.64
CO - 2	5	2	4	2	2	2	4	4	4	2	2	3.00
CO - 3	5	4	3	2	4	3	5	4	5	3	2	3.64
CO - 4	3	4	3	3	3	2	4	3	5	3	2	3.18
CO - 5	4	3	3	2	4	2	3	4	4	4	3	3.27
Overall Mean Score												**3.15**

Result: The Score for this Course is: **3.15** (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 Role Of XML - XML and The Web - XML Language Basics - SOAP - Web Services - Revolutions Of XML - Service Oriented Architecture (SOA).

(12 Hours)

UNIT II

XML TECHNOLOGY XML - Name Spaces - Structuring With Schemas and DTD - Presentation Techniques - Transformation - XML Infrastructure. **(12 Hours)**

UNIT III

SOAP Overview Of SOAP - HTTP - XML-RPC - SOAP: Protocol - Message Structure - Intermediaries - Actors - Design Patterns And Faults - SOAP With Attachments. **(12 Hours)**

UNIT IV

WEB SERVICES Overview - Architecture - Key Technologies - UDDI - WSDL - ebXML - SOAP And Web Services In E-Com - Overview Of .NET And J2EE.

(12 Hours)

UNIT V

XML SECURITY Security Overview - Canonicalization - XML Security Framework - XML Encryption - XML Digital Signature - XKMS Structure - Guidelines For Signing XML Documents - XML In Practice. **(12 Hours)**

BOOK FOR STUDY:

- **"XML, Web Services And The Data Revolution",** Frank. P. Coyle, Pearson Education, 2002.

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

BOOKS FOR REFERENCE:

1. **"XML in Easy Steps",** Mcgrath, Dream Tech Press, New Delhi, 2002.
2. **"XML Programming Bible",** Brian Benz with John R. Duran, Willey Publishing Inc., 2003.

E-COMMERCE

Semester: V

Code : 20CS5SS04 **Credits: 2***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand the unique features and types of e-commerce technology and their business significance.	PSO - 1	K
CO - 2	Identify the security threats in E-commerce and provide technical solutions for the problems in E-commerce Security Environment.	PSO - 5	AN
CO - 3	Comprehend the consumer behavior in digital commerce marketing and analyze advertising tools and strategies.	PSO - 3	C
CO - 4	Differentiate social, mobile and local marketing.	PSO - 1, PSO - 2	AN
CO - 5	Understand basic concepts related to privacy and information rights, the practices of e-commerce companies that threaten privacy, and the different methods that can be used to protect online privacy.	PSO - 2, PSO - 4	K

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

Semester: V				**E-COMMERCE**								**Credits: 2***
Code : 20CS5SS04												
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	2	4	3	5	5	4	3	3	3.27
CO - 2	4	5	3	3	3	4	4	5	3	3	5	3.81
CO - 3	4	3	3	2	3	3	4	4	5	3	4	3.45
CO - 4	3	3	3	2	5	2	5	5	4	5	4	3.27
CO - 5	3	5	3	3	4	3	4	5	4	5	3	3.81
Overall Mean Score												**3.52**

Result: The score for this course is **3.52** (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

The Revolution is Just Beginning: Uber: The New Face of E-commerce? - The First Thirty Seconds: Why You Should Study - Introduction to E-commerce - Unique Features of E-commerce Technology - Types of E-commerce - E-commerce: A Brief History - Understanding E-commerce: Organizing Themes - Academic Disciplines Concerned with E-commerce.

UNIT II

E-Commerce Security and Payment Systems: Cyberwar: MAD 2.0 251 - The E-commerce Security Environment - Security Threats in the E-commerce Environment - Technology Solutions - Management Policies, Business Procedures, and Public Laws - E-commerce Payment Systems - Electronic Billing Presentment and Payment.

UNIT III

E-Commerce Marketing and Advertising Concepts: Video Ads: Shoot, Click - Consumers Online: The Internet Audience and Consumer - Digital Commerce Marketing and Advertising Strategies and Tools - Internet Marketing Technologies - Understanding the Costs and Benefits of Online Marketing.

UNIT IV

Social, Mobile and Local Marketing: Facebook: Putting Social Marketing to Work - Introduction to Social, Mobile, and Local Marketing - Social Marketing - Mobile Marketing - Local and Location-Based Mobile Marketing.

UNIT V

Ethical, Social, and Political Issues in E-Commerce: The Right to Be Forgotten: Europe Leads on Internet Privacy - Understanding Ethical, Social, and Political Issues in E-commerce - Privacy and Information Rights - Intellectual Property Rights - Governance - Public Safety and Welfare.

BOOK FOR STUDY:

- **"E-Commerce 2017: Business, Technology, and Society",** Kenneth C. Laudon, Carol Guercio Traver, 13th Edition, Pearson, 2018.

UNIT I	:	Chapter	:	1
UNIT II	:	Chapter	:	5
UNIT III	:	Chapter	:	6
UNIT IV	:	Chapter	:	7
UNIT V	:	Chapter	:	8

BOOKS FOR REFERENCE:

1. **"E-COMMERCE: An Indian Perspective",** P.T. Joseph, S.J., PHI Learning Private Limited, Delhi, 5th Edition, 2015.
2. **"E-Commerce 2019: Business, Technology and Society**", Kenneth Laudon ,Carol Traver, Pearson Education Limited, 15th Edition, 2020.

COMPUTER NETWORKS

Semester: VI **Hours: 4**

Code : 20CS6MC11 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the functions of each layer in OSI and TCP/IP model.	PSO - 1	K
CO - 2	Explain the types of transmission media with real time applications in physical layer.	PSO - 2, PSO - 3	U
CO - 3	Illustrate the functions of data link layer and explain the protocols.	PSO - 3, PSO - 5	AN
CO - 4	Classify routing protocols and analyze the assignment of IP addresses for any network.	PSO - 3, PSO - 4	U
CO - 5	Elucidate the functions of Application layer and discuss cryptography and network security.	PSO - 2, PSO - 3	AP

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

Semester: VI			**COMPUTER NETWORKS**						**Hours: 4**			
Code : 20CS6MC11												**Credits: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	4	2	2	4	4	4	4	3	4	3.55
CO - 2	4	4	4	2	2	3	4	4	4	3	4	3.45
CO - 3	4	4	4	2	2	2	4	3	3	3	4	3.18
CO - 4	4	4	4	2	2	2	5	4	4	3	4	3.45
CO - 5	4	4	4	2	2	3	4	4	4	4	5	3.64
Overall Mean Score												**3.45**

Result: The Score for this Course is: **3.45** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Introduction: 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 Sub layer:** 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 Control Algorithms - Quality of service - Internetworking. **The Transport Layer:** The Transport Service - Elements of Transport Protocols - Congestion Control - The Internet Transport Protocols: 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. **Network Security:** Cryptography - Symmetric key Algorithms - Public key Algorithms - Digital Signatures - Management of public keys - Communication Security.

(12 Hours)

BOOKS FOR STUDY:

1. "**Computer Networks**" - Andrew S. Tanenbaum, David J. Wetherall, Pearson Education Inc., Dorling Kindersley (India) Pvt. 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

2. "**Data Communications and Networking**" Behrouz A. Forouzan - TATA McGraw - Hill, Fifth Edition, Special Indian Edition 2013.

   UNIT V : Chapter : 32.1- 32.4

BOOKS FOR REFERENCE:

1. **"Computer Networks a Systems Approach",** Larry L. Peterson and Bruce S. Davie, Fifth Edition, Reprint - 2014.
2. "**Computer Networks",** Bhushan Trivedi, OXFORD University press, 2011.

DATA WAREHOUSING AND MINING

Semester: VI **Hours: 4**

Code : 20CS6MC12 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand Data Warehouse fundamentals, Data Mining Principles and Applications.	PSO - 1, PSO - 2	U
CO - 2	Apply the association rules for mining the data	PSO - 2, PSO - 3	AP
CO - 3	Design and deploy appropriate classification techniques and Cluster the high dimensional data for better organization of the data	PSO - 3, PSO - 4	AP
CO - 4	Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining	PSO - 2, PSO - 4	U
CO - 5	Evolve Multidimensional Intelligent model from typical system and evaluate various mining techniques on complex data objects	PSO - 2, PSO - 3, PSO - 5	AN

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

Semester: VI			**DATA WAREHOUSING AND MINING**								**Hours: 4**
Code : 20CS6MC12											**Credits: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	4	3	2	3	5	4	2	2	2	3.00
CO - 2	4	3	4	5	4	4	2	5	4	2	2	3.54
CO - 3	3	3	2	3	3	3	2	2	5	4	3	3.00
CO - 4	3	4	3	4	3	4	3	5	3	4	3	3.54
CO - 5	3	4	4	3	3	3	2	5	4	2	4	3.36
Overall Mean Score												**3.29**

Result: The Score for this Course is: **3.29** (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- Definition - Kinds of Data Mined -Kinds of Patterns Mined - Technologies Used -Kinds of Applications Targeted - Major Issues in Data Mining. **Getting to Know Your Data:** Data Objects and Attribute Types - Basic Statistical Descriptions of Data - Data Visualization - **Measuring Data Similarity and Dissimilarity.** **(12 Hours)**

UNIT II

Data Preprocessing: Data Preprocessing: An Overview - Data Cleaning - Data Integration - Data Reduction. **Data Warehousing and Online Analytical Processing:** Data Warehouse: Basic Concepts - Data Warehouse Modeling: Data Cube and OLAP - Data Warehouse Design and Usage. (**12 Hours)**

UNIT III

Mining Frequent Patterns, Association and Correlations: Basic Concepts and Methods: Basic Concepts - Frequent Item Set Mining Methods - Patterns Interesting - Pattern Evaluation Methods. **Classification: Basic Concepts:** Basic Concepts - Decision Tree Induction - Bayes Classification Methods - Rule-Based Classification. **Classification: Advanced Methods:** Classification by Backpropagation - Support Vector Machines. **(12 Hours)**

UNIT IV

Cluster Analysis: Basic Concepts and Methods: Cluster Analysis - Partitioning Methods - Hierarchical Methods - Density-Based Methods. **Advanced Cluster Analysis:** Clustering High-Dimensional Data - Clustering Graph and Network Data. **(12 Hours)**

UNIT V

Outlier Detection: Outlier and Outlier Analysis - Outlier Detection Methods - Statistical Approaches. **Data Mining Trends and Research Frontiers:** Mining Complex Data Types - Other Methodological of Data Mining - Data Mining Applications - Data Mining and Society - Data Mining Trends. **(12 Hours)**

BOOK FOR STUDY:

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

UNIT I	**:**	Chapters	: 1.1 - 1.7, 2.1 - 2.3
UNIT II	**:**	Chapters	: 3.1 - 3.3, 4.1 - 4.3
UNIT III	**:**	Chapters	: 6.1 - 6.3, 8.1 - 8.4, 9.2, 9.3
UNIT IV	**:**	Chapters	: 10.1 - 10.4, 11.2, 11.3
UNIT V	**:**	Chapters	: 12.1 - 12.3, 13.1 - 13.5

BOOKS FOR REFERENCE:

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

MOBILE SATELLITE COMMUNICATION

Semester: VI **Hours: 4**

Code : 20CS6MC13 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Grasp the concepts and features of mobile satellite technologies and applications.	PSO - 1	K
CO - 2	Describe and apply the concepts telecommunication switching, traffic and networks	PSO - 4	AP
CO - 3	Demonstrate the mobile telecommunications and Satellite Constellations.	PSO - 4	AP
CO - 4	Analyze the telecommunication traffic.	PSO - 5	E
CO - 5	Analyze and recognize the working principles of Radio Link and Space craft in mobile satellite communication.	PSO - 3	AN

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

Semester: VI			**MOBILE SATELLITE COMMUNICATION**						**Hours: 4**			
Code : 20CS6MC13												**Credits: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	3	3	3	3	4	4	4	4	4	3.45
CO - 2	3	3	3	3	3	3	4	4	3	3	3	3.18
CO - 3	3	3	3	3	3	3	3	3	3	3	3	3.00
CO - 4	3	3	3	3	3	3	4	4	4	4	4	3.45
CO - 5	4	4	4	4	4	4	3	3	3	3	3	3.54
Overall Mean Score												**3.32**

Result: The Score for this Course is: **3.32** (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: Scope and organization - Evolution of Mobile Telecommunications - Satellite System Architecture - Business Plan - Regulatory Considerations - Operational Considerations - Mobile Systems - A Comparison. **Satellite Constellations**: Satellite Orbits -Satellite Constellations. **(12 Hours)**

UNIT II

Radio Link: Introduction - Spectrum Issues - Propagation Characteristics - Radio Link Analysis. **Modulation, Coding and Multiple Access:** Introduction - Modulation - Coding -Multiple Access Schemes. **(12 Hours)**

UNIT III

Fixed Earth Stations and User Terminals: Introduction - Gateways - User Terminals - Environmental Issues. **Spacecraft:** Introduction - Satellites for MSS - Intersatellite links - Emerging Technologies - Launching Satellite Constellations. **(12 Hours)**

UNIT IV

System Architecture: Introduction - Air Interface - System Development - Network Considerations. **Satellite Radio Interface Standards:** Introduction - Satellite Radio Interface Standards - Interactive Mobile Broadband Broadcast Standard. **(12 Hours)**

UNIT V

Operational Considerations: Introduction - Perspective - Subscriber and Gateway Commissioning - Radio Resource Management - Radio Frequency Monitoring - Quality of Service - Licensing Issues. **Commercial Issues:** Introduction - System Planning - Service Distribution Model -Billing Issues - Regulatory Issues - Traffic Forecast - End-User Perspective - A case Study. **(12 Hours)**

BOOK FOR STUDY:

- **"Mobile Satellite Communication Principles and Trends",** Second Edition, Madhavendra Richharia. Knowledge Space Ltd., John Wiley and Sons UK, 2014.

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

BOOKS FOR REFERENCE:

1. **"Mobile Satellite Communications Handbook",** Roger Cochetti, Second Edition, Published by John Wiley and Sons, 2015.
2. **"Global Mobile Satellite Communications Applications",** Stojce Dimov Iicev, Springer Private Ltd., 2018.
3. **"Mobile Computing",** Raj Kamal, Second Edition, Oxford University Press, 2011.

IoT FUNDAMENTALS

Semester: VI **Hours: 4**

Code : 20CS6DE4A **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Learn the fundamental Concepts of Internet of Things	PSO - 1	K
CO - 2	Understand the IoT Applications and its Value Creation for Industry	PSO - 1, PSO - 2	U
CO - 3	Develop deep knowledge in Internet of Things Privacy, Security and Governance	PSO - 2, PSO - 3, PSO -5	AP
CO - 4	Analyze IoT physical devices & endpoints	PSO - 2, PSO - 3	AN
CO - 5	Understand the Internet of Things Standardisation.	PSO - 1, PSO - 5	U

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

Semester: VI				**IoT FUNDAMENTALS**							**Hours: 4**
Code : 20CS6DE4A											**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	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	3	3	3.91
CO - 4	5	4	5	4	3	3	5	5	5	3	3	4.09
CO - 5	5	4	5	4	3	3	5	5	5	3	3	4.09
Overall Mean Score												**3.82**

Result: The Score for this Course is: **3.82** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Introduction to IoT: What is IoT - Genesis of IoT - IoT and Digitization - IoT Impact - Convergence of IT and OT - IoT Challenges. **IoT Network Architecture and Design:** Drivers Behind New Network Architectures - Comparing IoT Architecture - A Simplified IoT Architecture - The Core IoT Fundamentals Stack - IoT Data Management and Compute Stack. **(12 Hours)**

UNIT II

Engineering IoT Networks: Smart Objects: The Things in IoT: Sensors, Actuators, and Smart Objects - Sensor Networks. **Connecting Smart Objects:** Communications Criteria - IoT Access Technologies. **(12 Hours)**

UNIT III

IP as the IoT Network Layer: The Business Case for IP - The Need for Optimization - Optimizing IP for IoT - Profiles and Compliances. **Application Protocols:** The Transport Layer - IoT Application Transport Methods. **(12 Hours)**

UNIT IV

Data and Analytics for IoT: An Introduction to Data Analytics for IoT - Machine Learning - Big Data Analytics Tools and Technology - Edge Streaming Analytics**. Securing IoT:** A Brief History of OT Security - Common Challenges in OT Security - How IT and OT Security Practices and Systems Vary - Formal Risk Analysis Structures: OCTIVE and FAIR - The Phased Application of Security in an Operational Environment. **(12 Hours)**

UNIT V

Smart and Connected Cities: An IoT Strategy for Smarter Cities - Smart City IoT Architecture - Smart City Security Architecture - Smart City Use-Case Examples. **Transportation:** Transportation and Transports - Transportation Challenges - IoT Use Cases for Transportation - An IoT Architecture for Transportation. **(12 Hours)**

BOOK FOR STUDY:

- **"IoT Fundamentals Networking Technologies, Protocols and Use Cases for the Internet of Things**", David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton, Jerome Henry, Pearson India Education Services Pvt. Ltd, 2019.

UNIT I	**:**	Chapters	: 1, 2
UNIT II	**:**	Chapters	: 3, 4
UNIT III	**:**	Chapters	: 5, 6
UNIT IV	**:**	Chapters	: 7, 8
UNIT V	**:**	Chapters	: 12, 13

BOOKS FOR REFERENCE:

1. "**Internet of Things Architecture, Implementation and Security**", Mayur Ramgir, Pearson Education, First Impression, 2020.
2. "I**nternet of Things Architecture and Design Principles"**, Raj Kamal, Mc Graw Hill Education (India) Private Limited, 2017.

COMPUTATIONAL INTELLIGENCE

Semester: VI **Hours: 4**

Code : 20CS6DE4B **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain knowledge for artificial intelligence techniques and different types of agents to solve problems.	PSO - 2	K
CO - 2	Understand the Heuristic Search techniques, Hill Climbing, Best-Fist algorithms	PSO - 3, PSO - 4	U
CO - 3	Represent various real-life domains using logic-based techniques	PSO - 3, PSO - 4	AP
CO - 4	Apply knowledge representation, reasoning and machine learning techniques to real world issues.	PSO - 2, PSO - 3, PSO - 5	AP
CO - 5	Enhance the skills to build simple knowledge-based system.	PSO - 2, PSO - 3	AN

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

Semester: VI			**COMPUTATIONAL INTELLIGENCE**						**Hours: 4**			
Code : 20CS6DE4B												**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	4	4	4	2	4	3	4	3	4	4	3	3.54
CO - 2	2	5	3	3	3	4	4	5	4	3	2	3.45
CO - 3	4	4	3	2	3	3	4	4	5	3	4	3.54
CO - 4	3	3	3	2	5	2	4	4	3	5	5	3.54
CO - 5	3	3	3	2	2	3	4	4	4	3	3	3.00
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

Introduction To Knowledge-Based Intelligent Systems: Intelligent Machines or what machines can do - The History of Artificial Intelligence, or From The "Dark Ages' To Knowledge-Based Systems. **Rule-Based Expert Systems:** Introduction, or what is knowledge - Rules as a Knowledge Representation Technique - The Main Players in the Expert System Development Team - Structure of a Rule-Based Expert System - Fundamental Characteristics of an Expert System - MEDIA ADVISOR: a Demonstration Rule-Based Expert System - Advantages And Disadvantages of Rule- Based Expert Systems. **(12 Hours)**

UNIT II

Fuzzy Expert Systems: Introduction or what is Fuzzy thinking - Fuzzy Sets - Linguistic Variables and Hedges - Operations of Fuzzy Sets - Fuzzy Rule - Fuzzy Inference - Building a Fuzzy Expert system. **(12 Hours)**

UNIT III

Artificial Neural Networks: Introduction, or How the brain works - The Neuron as a Simple Computing Element - The Perception - Multilayer Neural Networks - Accelerated Learning in Multilayer Neural Networks - The Hopfield Network - Bidirectional Associative Memory. **Evolutionary Computation:** Introduction, or Can Evolution be Intelligent - Simulation of Natural Evolution - Genetic Algorithms - Why Genetic Algorithms Work - Case Study: Maintenance Scheduling with Genetic Algorithms - Evolution Strategies - Genetic Programming. **(12 Hours)**

UNIT IV

Hybrid Intelligent Systems: Introduction, or How to Combine German Mechanics with Italian Love - Neural Expert Systems - Neuro-Fuzzy Systems - ANFIS: Adaptive Neuro-Fuzzy Inference System - Evolutionary Neural Systems. **(12 Hours)**

UNIT V

Knowledge Engineering: Introduction, or what is knowledge engineering - Will an Expert System work for my Problem - Will a Fuzzy Expert System Work for my Problem - Will a Neural Network Work for my Problem - Will Genetic Algorithms Work for my Problem - Will a Hybrid Intelligent System work for my Problem.

(12 Hours)

BOOK STUDY:

- **"Artificial Intelligence",** Michael Negnevitisky, Pearson Indian Education Services Pvt. Ltd., 3rd Edition, 2020.

UNIT I	**:**	Chapters	: 1, 2
UNIT II	**:**	Chapter	: 4
UNIT III	**:**	Chapters	: 6, 7
UNIT IV	**:**	Chapter	: 8
UNIT V	**:**	Chapter	: 9

BOOKS FOR REFERENCE:

1. **"Artificial Intelligence a modern Approach",** Stuart J. Russell & Peter Norvig, 3rdEdition, Perason Education, 2016.
2. **"Computer Graphics with Virtual Reality Systems",** Rajesh K. Maurya, Wiley India Pvt. Ltd, Third Edition, 2018.

NEURAL NETWORKS

Semester: VI **Hours: 4**
Code : 20CS6DE4C **Credits: 3**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Comprehend the concepts of feed forward neural networks.	PSO - 1, PSO - 2	K
CO - 2	Analyze the various feedback networks.	PSO - 2	AN
CO - 3	Understand the concept of fuzziness involved in various systems and fuzzy set theory.	PSO - 3	U
CO - 4	Comprehend the fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.	PSO - 2, PSO - 4	AN
CO - 5	Analyze the application of fuzzy logic control to real time systems.	PSO - 4, PSO - 5	AP

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

Semester: VI				**NEURAL NETWORKS**							**Hours: 4**
Code : 20CS6DE4C											**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	4	5	5	5	3	5	4	5	5	5	4	4.55
CO - 2	5	5	5	4	3	4	5	5	4	5	4	4.45
CO - 3	5	5	5	3	3	4	5	5	5	5	5	4.55
CO - 4	4	5	4	5	5	5	4	4	5	5	4	4.55
CO - 5	4	3	3	4	5	4	3	4	3	5	4	3.82
CO - 6	4	5	3	5	4	4	4	4	4	5	4	4.18
Overall Mean Score												**4.35**

Result: The Score for this Course is: **3.45** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Neural Networks : Basic concepts of Neural Networks - Human Brain - Model of an Artificial Neuron - Neural Network Architectures - Characteristics of Neural Networks - Learning Methods. **Back Propagation Networks**: Architecture of a Back propagation Network - Back propagation Learning - Illustration. **(12 Hours)**

UNIT II

Associative Memory: Autocorrelators - Hetrocorrelators. Adaptive Resonance Theory: Introduction - ART1 - ART2 - Applications - Sensitiveness of ordering of Data. **(12 Hours)**

UNIT III

Extreme Learning Machine: ELM Algorithm - ELM for Regression - ELM for binary classification. **Fuzzy Systems: Fuzzy Set Theory:** Fuzzy Versus Crisp - Crisp Sets - Fuzzy Sets - Crisp Relations. **(12 Hours)**

UNIT IV

Fuzzy Logic and Inference: Crisp Logic - Predicate Logic - Fuzzy Logic - Fuzzy Rule Based - Defuzzification - Applications. **(12 Hours)**

UNIT V

Type-2 Fuzzy Sets : Representations of Type-2 Fuzzy Sets - Operations on Type-2 Fuzzy Sets - Interval Type-2 Fuzzy Sets. **Evolutionary Algorithms: Fundamentals of Genetic Alogorithms:** Genetic Algorithms: History - Basic Concepts - Creation of Offsprings - Working Principles - Encoding. **(12 Hours)**

BOOK FOR STUDY:

- **"Neural Networks, Fuzzy Systems and Evolutionary Algorithmms Synthesis and Applications",** S. Rajasekaran, G. A Vijayalakshmi Pai, PHI Learning Private Limited 2017 , Delhi.

UNIT - I	**:**	Chapters	:	2.1-2.6, 3.1-3.3
UNIT - II	**:**	Chapters	:	4.1,4.2, 5.1-5.5
UNIT - III	**:**	Chapters	:	6.1-6.3, 7.1-7.4
UNIT - IV	**:**	Chapter	:	8.1-8.6
UNIT - V	**:**	Chapters	:	9.1-9.3, 10.1-10.5

BOOKS FOR REFERENCE:

1. **"Neural Networks for Beginners",** Russo, Russel R, Published by Zanshin Honya Ltd., 2019.
2. **"Fuzzy Neural Networks for Real Time Control Applications",** Erdal Kaycan, Mojtaba Ahmadieh Khanesar by Elsevier, 2016.

PROJECT

Semester: VI **Hours: 10**

Code : 20CS6MCP1 **Credits: 9**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire practical knowledge within the chosen area of technology for project development.	PSO - 2	AP
CO - 2	Apply knowledge of computing and information technologies to produce effective designs and solutions for specific computer-based problems.	PSO - 2, PSO - 4	AP
CO - 3	Identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach.	PSO - 2, PSO - 5	AN
CO - 4	Describe the impact upon society of computers, and the technical and human aspects of this impact.	PSO - 3, PSO - 4	AP
CO - 5	Effectively communicate during project development and present results for the area of concentration.	PSO - 5	AP

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

Semester: VI				**PROJECT**							**Hours: 10**
Code : 20CS6MCP1											**Credits: 9**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	4	2	2	4	4	4	4	3	4	3.55
CO - 2	4	4	4	2	2	3	4	4	4	3	4	3.45
CO - 3	4	4	4	2	2	2	4	3	3	3	4	3.18
CO - 4	4	4	4	2	2	2	5	4	4	3	4	3.45
CO - 5	4	4	4	2	2	3	4	4	4	4	5	3.64
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

ANIMATION - LAB

Semester: VI **Hours: 2**

Code : 20CS6GE02 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Demonstrate the effective utilization of flash tool	PSO - 1	U
CO - 2	Exhibit the layer techniques for designing.	PSO - 2	AP
CO - 3	Execute the various types of tweening	PSO - 2	AP
CO - 4	Apply the various animation techniques to animate text and create symbols.	PSO - 1, PSO - 2	AP
CO - 5	Build an animated short story using various techniques	PSO - 2	C

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

Semester: VI				**ANIMATION - LAB**							**Hours: 2**
Code : 20CS6GE02											**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	5	5	4	3	3	2	4	5	3	3	2	3.55
CO - 2	5	5	3	3	4	3	4	5	3	3	2	3.64
CO - 3	5	5	4	3	3	2	5	5	3	2	2	3.55
CO - 4	5	5	4	2	3	3	4	5	4	3	3	3.73
CO - 5	5	4	4	3	4	2	4	5	3	3	3	3.64
Overall Mean Score												**3.62**

Result: The Score for this Course is: **3.62** (High Relationship)

Note:

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

Values Scaling:

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

1. Working with Tools
2. Working with Panels
3. Creating symbols
4. Frame by frame animation
5. Motion Tweening
6. Shape Tweening
7. Animating Text
8. Working with multiple layers
9. Working with Guide layers
10. Working with Mask layers
11. Short story creation with multiple scenes

ORGANIZATION AND HEALTH PROGRAMME IN NCC

Semester: VI **Hours: 2**

Code : 20GE6NC02 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Attain knowledge on History, honors and awards of Indian Military	PSO - 1,PSO - 2, PSO - 4	K, An, Ap,
CO - 2	Perceive knowledge on read the maps, so that they are able to locate themselves when need arises.	PSO - 1, PSO - 4	K, An, C
CO - 3	Explain the medical knowledge which consists of anatomy and physiology of human body.	PSO - 2,PSO - 3, PSO 4, PSO - 5	K, S, Ap
CO - 4	Analyse the personal hygiene and sanitation.	PSO - 4, PSO - 5	K, An, E
CO - 5	Develop technical skill of first Aid and how to effectively deal with minor injuries.	PSO - 1, PSO - 2	K, Ap, S, E

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

Semester: IV				**ORGANIZATION AND HEALTH PROGRAMME IN NCC**							**Hours: 2**
Code : 20GE6NC02											**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	5	4	4	2	2	2	4	5	3	3	5	3.55
CO - 2	4	4	4	2	3	2	4	4	4	4	5	3.64
CO - 3	5	4	3	2	2	3	3	3	5	3	2	3.18
CO - 4	5	5	4	3	2	3	5	5	4	5	3	4.00
CO - 5	4	3	3	3	2	2	4	4	5	5	4	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 = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos = Total of Mean Scores / Total No. of Cos

UNIT I: INDIAN MILITARY AND NCC ORGANIZATION

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- Honours and Awards. **(6 Hours)**

UNIT II: MAP READING

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. **(6 Hours)**

UNIT III: HYGIENE AND SANITATION

Personal Hygiene - Sanitation - Methods of purification of drinking water -Latrine types - Urinal Types. **(6 Hours)**

UNIT IV: TYPES OF DISEASE AND POLLUTION

Define Health - Types of Health - Communicable and Non communicable Disease - Pollution and its type. **(6 Hours)**

UNIT V: FIRST AID

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. **(6 Hours)**

BOOK FOR REFERENCE:

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

INTERNAL QUESTION PATTERN

Time: 2 hours **Marks: 30**

PART - A

Answer Any 4 out of five $4 \times 2 = 8$

PART- B

Two either or questions (one from each) $2 \times 4 = 8$

PART - C

Two either or questions (one from each $2 \times 7 = 14$

STATISTICS FOR COMPUTER SCIENCE

Semester: VI **Hours: 2**

Code : 20SE6CS04 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain knowledge about the concepts of probability.	PSO - 1	K
CO - 2	Distinguish between discrete and continuous random variables.	PSO - 2	AP
CO - 3	Create knowledge about various probability distributions, which are used in statistical investigation of real-life situations.	PSO - 1, PSO -4	AP
CO - 4	Develop clear idea regarding correlation and regression.	PSO - 1, PSO -3	S
CO - 5	Understand the concepts of Analysis of Variance and Design of experiments. Learn Regression and Correlation.	PSO - 5	AP

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

Semester: VI			**STATISTICS FOR COMPUTER SCIENCE**								**Hours: 2**
Code : 20SE6CS04											**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	2	3	3	3	3	3	2	2	3	3	3	2.73
CO - 2	3	3	3	3	3	3	4	3	3	3	4	3.18
CO - 3	2	3	3	4	3	3	3	3	3	3	3	3.00
CO - 4	4	3	3	2	3	3	4	3	3	3	3	3.09
CO - 5	5	3	3	4	4	2	5	5	3	4	3	3.73
Overall Mean Score												**3.15**

Result: The Score for this Course is: **3.15** (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, Skewness and Kurtosis: Introduction- Moments - The r^{th} moment about any point A - r^{th} central moment - Karl Pearson's β and γ coefficients. Skewness and Kurtosis: Positive skewness - Negative skewness - Absolute measures of skewness - Karl Pearson's coefficient of skewness - Kurtosis. **Curve fitting:** Principles of least squares - Fitting a straight line - Fitting a second degree parabola. **(6 Hours)**

UNIT II

Correlation and Regression: Introduction - Correlated - Direct (positive) - Inverse (negative) - Perfect - Covariance - Perfect and positive - Perfect and negative - Uncorrelated - Rank correlation: Spearman's formula. Regression line of y on x - Regression line of x and y - Regression coefficient of y on x - Regression coefficient of x on y - Correlation coefficient for a bivariate frequency distribution. **(6 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. Independence and association of data: Independent - Association and coefficient association - Associated - Positively associated - Negatively associated - Coefficient of association - Yule's coefficient. **(6 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. Conditional probability: Multiplication theorem for frequencies - Independent - Pairwise independent - Mutually independent - Baye's theorem - Boole's inequality. **(6 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 variable. Mathematical expectations: Mathematical Expectation of continuous random variable - Mean value - r^{th} moment - Standard deviation - r^{th} central moment. **(6 Hours)**

BOOK FOR STUDY:

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

UNIT I	**:**	Chapters	: 4, 5
UNIT II	**:**	Chapter	: 6
UNIT III	**:**	Chapter	: 8
UNIT IV	**:**	Chapter	: 11
UNIT V	**:**	Chapter	: 12

BOOKS FOR REFERENCE:

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

STUDENT TRAINING PROGRAMME
NATIONAL CADET CORPS

U.G. PROGRAMME OUTCOMES (2020 - 2023)

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 : 20STPNC01 **Credits: 2***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Attain knowledge on History, honors and awards of Indian Military.	PSO - 1,PSO - 2, PSO - 4	K, An, Ap,
CO - 2	Perceive knowledge on read the maps and Weapon training is to remove the fear of a weapon from the hearts of youth.	PSO - 1, PSO - 4	K, An, C
CO - 3	Analyze the different types of disasters under different circumstances.	PSO - 2,PSO - 3, PSO 4, PSO - 5	K, S, Ap
CO - 4	Achieve practical knowledge in community development and other social programmes.	PSO - 4, PSO - 5	K, An, E
CO - 5	Comprehend the personality development and develop technical skill of first Aid .	PSO - 1, PSO - 2	K, Ap, S, E

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

Semester: I - IV				**NATIONAL CADET CORPS**							**Hours: 240**
Code : 20STPNC01											**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	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 = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

NATIONAL CADET CORPS

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

Code : 20STPNC01 **Credits: 2***

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 REFERENCE

- 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: 40 **Time: 2 hours**

Section - A

Answer All Questions 5 × 1 = 5 Marks
(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)

NATIONAL SERVICE SCHEME

U.G. PROGRAMME OUTCOMES (2020 - 2023)

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
PSO - 1	Understand and identify the needs of the community	PO1, PO3
PSO - 2	Develop among themselves a sense of social and civic responsibility.	PO2, PO3, PO4, PO6
PSO - 3	Apply their education in finding practical solution to individual and community problems.	PO1, PO3, PO4, PO6
PSO - 4	Acquire leadership qualities and democratic attitude.	PO2, PO3, PO5
PSO - 5	Develop capacity to meet emergencies and national disasters and practice national integration and social harmony	PO3, PO4, PO5

NATIONAL SERVICE SCHEME

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

Code : 20STPNS01 **Credits: 2***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Attain a Citizen with Social Concern and Social Analysis	PSO - 1, PSO - 2, PSO - 5	An
CO - 2	Flourish physical and mental health through Yoga	PSO - 2, PSO - 4	Ap
CO - 3	Practice to have healthy Food	PSO - 3, PSO - 5	S, Ap
CO - 4	Preserve Environment	PSO - 2, PSO - 3, PSO - 4	C, K, Ap
CO - 5	Understand and Challenge problems of Women.	PSO - 1, PSO - 2, PSO - 5	An, Ap, K

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

Semester: I - IV							**NATIONAL SERVICE SCHEME**					**Hours: 240**
Code : 20STPNS01												**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	3	5	4	3	3	3	5	3	3	5	3.64
CO - 2	3	4	3	2	4	3	4	5	4	5	2	3.55
CO - 3	3	3	4	3	3	4	3	3	5	3	5	3.55
CO - 4	2	2	3	3	2	3	3	5	5	5	3	3.27
CO - 5	3	3	5	3	3	4	5	5	3	3	5	3.82
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 OF NSS

Introduction - History and Growth - Objectives - NSS Motto - NSS Symbol - NSS Badge - NSS Day - Composition of NSS Unit - NSS Regular Activities & Special Camp - Village Survey & Volunteers Diary - Campus Work - National and International Important days - NSS Awards.

UNIT II: CITIZENSHIP

Duties of a citizen - Social Service - Social Problems - Need for Social Service - Leadership - Social Service & Leadership quality- Personnel and Social Values.

UNIT III: YOUTH

Introduction - Education & Social Concern - Youth & Family - Youth & Society - Capability of youth - Problems of Youth - Drug Abuse - Hero Worship - Addict to Social Media - Violence - Sexual Problems - Suicide.

UNIT IV: HEALTH & HYGIENE

Introduction - Health & Hygiene - Food Hygiene - Personal Hygiene - Health Maintenance: Care of Skin, Hair, Teeth, Eyes - Health Assessment of Fitness - Approaches for keeping Fit.

UNIT V: FOOD AND NUTRITION

Food - Nutrients - Components of Food: Carbohydrate, Protein, Lipid, Minerals, Vitamins and Water - Balanced Diet: Food Selection and Meal Planning - Caloric value of Fruits, Vegetables, Nuts and Sprouted Seeds.

UNIT VI: ENVIRONMENT AND ECOLOGY

Ecology - Components of Ecology - Environment - Pollution - Water Pollution - Air Pollution - Soil Pollution - Noise Pollution - Pollution Control & Environment Preservation.

UNIT VII: WOMEN EMPOWERMENT

Women - Women & Family - Women & Society - Women & Education - Women Leaders - Women Problem - Women Empowerment to overcome problems.

UNIT VIII: FIRST AID

Principles of First Aid - First aid for burns and scalds - First aid for fractures - First aid for insect bite - First aid for dog bite - First aid for electric shock - First aid for drowning - First aid for haemorrhage - Important things kept in the first aid box.

UNIT IX: YOGA

Origin of Yoga and its development - Human Body & Mind - Benefits of Yoga - Classification of Yoga - Pranayama - Types of Pranayama - Utkatasana (Chair Pose) - Trikonasana (Triangle Pose).

UNIT X: PRACTICAL KNOWLEDGE

Entrepreneurial Training: Phenol, Soap Powder, Soap, Candle and Ornaments Making - Gardening - Solid Waste Management - Special Camp: 7 Days

BOOKS FOR REFERENCE:

1. C.S.C. Herve Morrissette, Youth aware, Holy cross fathers, Bangalore, 1977, Seema Yadav, Food Hazards and Hygiene, Anmol Publications Pvt. Ltd, New Delhi, Ist edition, 1997
2. Gitanjali Chatterjee, Hand Book of Food and Nutrition, Rajat Publications Pvt. Ltd, 2000,
3. Archana Sharma, Environment: Ecology, Climate change, Global warming, Biology Biodiversity, Conservation, Face the Challenge Academy, 2018,
4. Jaimon Varghese, Women Empowerment Through Literacy Campaign, Concept Publishing Company Pvt. Ltd, 2012.
5. Rajeev Sharma, First Aid, Lotus Press, New Delhi-2, 2009.
6. Amresh Kumar, Yoga for Healthy body, Khel Sahitya Kendra, New Delhi-2, 2009.

Scheme of Evaluation	
Summative Examination (2 hours)	40 Marks
Continuous Internal Assessment	60 Marks
Total	**100 Marks**

Scheme of Evaluation of Continuous Internal Assessment		
1.	Attendance - 240 hours	10 Marks
2.	Special Camp	40 Marks
3.	Case Study	10 Marks
Total		**60 Marks**

Question Pattern for Summative Examination

Total Marks: 40 **Time: 2 hours**

Section - A

Answer All Questions 10 × 1=10 Marks
(Multiple Choice Questions)

Section - B

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

Section - C

Answer Any Two Questions 2 × 10=20 Marks
(Two Questions Out of Three)

PHYSICAL EDUCATION

U.G. PROGRAMME OUTCOMES (2020 - 2023)

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	Elucidate basic knowledge and professional experience in Yoga	PO-1, PO-3
2	Equip with the profound knowledge of Sports and Games	PO-1, PO-4
3	Intake balanced nutrition and practice hygiene.	PO-1, PO-5, PO-6.
4	Enlighten the peoples with the principles of first aids	PO-2, PO-6
5	Expound the concepts and demonstrate Aerobics and Pyramids	PO-1, PO-2, PO-5,PO-5, PO-6

PHYSICAL EDUCATION - COURSE PATTERN (2017 - 2020)

Sem.	Code	Title of the Paper	Hours	Credits
I & II	20STPPE01	Yoga and Rhythmic Activities	120	-
III & IV		Fundamentals of Physical Education	120	2*
		Total	**240**	**2***

YOGA AND RHYTHMIC ACTIVITIES

Semester: I & II **Hours: 120**

Code : 20STPPE01

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the principle of Asnas	PSO - 1,PSO - 3, PSO - 4	K, An, Ap,
CO - 2	Classify Pranayama for different needs	PSO - 1, PSO - 4	K, An, C
CO - 3	Appraise the application and effects of Suryanamaskar for human wellness	PSO - 2,PSO - 3, PSO 4, PSO - 5	K, S, Ap
CO - 4	Execute the techniques in Free Hand Exercise	PSO - 4, PSO - 5	K, An, E
CO - 5	Construct Pyramids based on the underlying principles	PSO - 1, PSO - 2	K, Ap, S, E

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

Semester: I - II				**PAPER I – YOGA AND RYTHEMIC ACTIVITIES**							**Hours: 120**
Code : 20STPPE01											
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	4	2	2	2	4	5	3	3	5	3.55
CO - 2	4	4	4	2	3	2	4	4	4	4	5	3.64
CO - 3	5	4	3	2	2	3	3	3	5	3	2	3.18
CO - 4	5	5	4	3	2	3	5	5	4	5	3	4.00
CO - 5	4	3	3	3	2	2	4	4	5	5	4	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: ASNAS

Sitting Postures - Standing Posture - Prone Posture - Supine Postures.

(24 hours)

UNIT II: PRANAYAMA

Pranayama - Suga Pranayama - Chandra bethana - Nadi Sudhi - Ujjayee - Seethali - Seethakari - Brahmari. **(24 hours)**

UNIT III: SURYANAMASKAR

Suryanamaskar: 12 Postures - 12 Postures & Breathe consioius - 12 Postures With manthra - Relaxation Techiniques. **(24 hours)**

UNIT IV: CALLISTHENICS (FREE HAND EXERCISE)

Standing series - Bending series - Sitting series - Twisting series - Dumb - bells - Indian Clubs - Lezium - Hoops. **(24 hours)**

UNIT V: AEROBICS & PYRAMIDS

Aerobics: Aerobic Basics - Aerobic Movements - Aerobic With Rhythm - Aerobic Programme Pyramids: Basics of Pyramids - Types of Pyramids. **(24 hours)**

BOOKS FOR REFERENCE:

1. Wuest Jeborah,A and Charles A. Bucher (1987), 'Foundation of Physical Education, B.I Publication Pvt.Ltd., New Delhi.
2. Elangovan.R, (2002), 'Utarkalvi Oru Arimugam', Ashwin Publication, Triunelveli.
3. Chandrasekaran.K, (1999), 'Sound Health through Yoga, Prem Kalyan Publication, Sedapatti.
4. Iyengar, B.K.S,'Lights on Yoga', Unwin Hyman Company, London

FUNDAMENTALS OF PHYSICAL EDUCATION

Semester: III & IV **Hours: 120**

Code : 20STPPE01 **Credits: 2***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
1.	Familiarize the fundamentals of Physical Education	PSO - 1, PSO - 3, PSO - 4	K, An, Ap,
2.	Illustrate different rules for different games and athletic events	PSO - 1, PSO - 4	K, An, C
3.	Examines the need for good nutrition	PSO - 2, PSO - 3, PSO 4, PSO - 5	K, S, Ap
4.	Synthesis the relation between hygiene and health	PSO - 4, PSO - 5	K, An, E
5.	Apply the first aid techniques	PSO - 1, PSO - 2	K, Ap, S, E

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

Semester: III - IV			PAPER II - FUNDAMENTALS OF PHYSICAL EDUCATION								Hours: 120
Code : 20STPPE01											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	5	3	3	2	2	4	5	4	3	3	5	3.55
CO - 2	5	4	4	2	3	4	5	4	4	4	5	4.00
CO - 3	5	5	4	2	2	3	3	5	3	3	4	4.00
CO - 4	5	4	3	2	2	4	4	5	4	4	5	3.82
CO - 5	5	4	4	2	3	3	5	4	2	5	4	3.73
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

UNIT I: PHYSICAL EDUCATION

Definition, need, scope, aims and objectives of physical education. **(24 hours)**

UNIT II: GAMES AND ATHLETEIC EVENTS

History of Games: Basketball, Volley Ball, Kho-Kho, Kabaddi, Badminton and Ball Badminton - Rules and regulation of the Games and Athletic Events. **(24 hours)**

UNIT III: NUTRITION

Balanced Diet, Daily Energy Requirement, Nutrient Balance, Nutrition Intake, Diet and Competition, Nutritional Tips, Your Ideal Weight. **(24 hours)**

UNIT IV: HEALTH EDUCATION

Meaning of health education, Definition of health education, Personal Hygiene, Communicable Diseases **(24 hours)**

UNIT V: FIRST AID

First Aid: Injuries to bones and Muscles, Sprain, Strain, Muscle Cramp and joints Dislocation and Fractures Snake-bite, Dog bite Poisoning, Artificial Respiration, (Drowning) **(24 hours)**

BOOKS FOR REFERENCE:

1. Sathyanesan, R.C., 'Hand Broken Physical Education, 'Gheena Publishers, Madurai.
2. Thirunarayanan,C and Hariharan,s, 'Analytical History of physical Education 'South India Press, Karaikudi.
3. St. 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.

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 AWARENESS

PROGRAMME OUTCOMES (PO)

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.	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-awareness, set and pursue meaningful goals, and develop positive personal qualities.

PROGRAM SPECIFIC OUTCOME (PSO)

PSO	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO - 1	Aware of Consumer's rights, responsibilities and Consumer Protection 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

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Aware of the Nature, Rights and Responsibilities of Consumer.	PO - 1	K
CO-2	Familiar with Food Trade Mark and Certification.	PO - 1, PO - 4, PO - 6	AN
CO-3	Identify Misleading Advertisement, Consumer Court and Consumer Redressal.	PO - 3, PO - 6	AP
CO-4	Acquire Knowledge in Food Adulteration and Eco friendly products.	PO - 3, PO - 4, PO - 6	K
CO-5	Attain Practical Experience through Field Visit and Interact with Experts.	PO - 4, PO - 5, PO - 6	S

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

Semester: I - IV				**CONSUMER AWARENESS - I & II**							**Hours:120**
Code : 20STPCC01											**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	5	5	4	5	4	3	3	4	5	4	5	4.27
CO-2	4	4	5	4	5	3	5	5	4	5	3	4.27
CO-3	5	5	4	5	4	5	3	4	5	4	5	4.45
CO-4	4	4	5	4	5	3	5	5	4	5	3	4.27
CO-5	5	4	5	4	5	3	5	4	5	4	5	4.45
Overall Mean Score												**4.34**

Result: The score for this course is **4.34** (Very 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

CONSUMER AWARENESS - I

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

Code : 20STPCC01

UNIT I

Consumer - Meaning - Consumerism - Nature of Consumerism, Rights and Responsibilities of Consumer - Right of Consumers under Consumer Protection Act 1986 - Do's and Dont's of Consumer.

UNIT II

Trade Mark - Definition - Meaning - Objectives -Types of Trademark in India - Process and functions of Registrar of Trade marks - Trade and Merchandise rules - Food Label Symbol, ISI, ISO, Agmark, Silkmark Certification.

UNIT III

Advertisement meaning - Features of Advertisement - Misleading Advertisement - circumstances of misleading advertisements -Reasons for Festival offer and discount.

UNIT IV

Food Adulteration - Meaning - Types of Food Adulteration - Method of Food Adulteration - How can Adulteration be prevented - How to Identify fake and Duplicate Beauty Products - Sub Standard Products.

UNIT V

Practical Session: Interacting with Experts, Field Visit

COURSE BOOK:

Material prepared by the Consumer Club

BOOKS FOR REFERENCE:

1. Dr. L. Natarajan, Business Legislation, Merit India Publication, 2017.

CONSUMER AWARENESS - II

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

Code : 20STPCC01 **Credit: 2***

UNIT I

Guarantee Vs. Warrantee - Standards of Weight - Meaning - Importance of Standards - Responsible to Certify the Accuracy of Weight and Measures - Food Quality Control Procedures - Vegetarian and Non-Vegetarian Symbol.

UNIT II

Consumer Redressd Consumer Disputes - Consumer Movement - Consumer Court - Do's and Don'ts of Consumers Grievances Redressal - How to Files Complaints in Consumer Court.

UNIT III

Online Consumer- Meaning- Types of Online Consumers- Rights of Online Consumers.

UNIT IV

Eco Friendly Consumer Products - Green Consumerism- Important Steps of Green Consumerism.

UNIT V

Practical Session: Interacting with Experts, Field Visit.

COURSE BOOK:

Material prepared by the Consumer Club

BOOKS FOR REFERENCE:

1. Dr. L. Natarajan, Business Legislation, Merit India Publication, 2017.
2. Consumer Movements, Francesca Forno
3. Helping People and Communities Become and Remain Economically
4. www.insightcced.org
5. https://www.researchgate.net/publication/334126464

SCHEME OF EVALUATION

1.	Summative Examination (3 hours)	:	75 marks
2.	Continuous Internal Assessment	:	25 marks
	Total	**:**	**100 marks**

Scheme of Evaluation of Continuous Internal Assessment		
1.	*Attendance - 120 hours*	*10 Marks*
2.	*Field Visit*	*10 Marks*
3.	*Assignment*	*5 Marks*
Total		***25 Marks***

QUESTION PATTERN FOR SUMMATIVE EXAMINATION

Total Marks: 75 **Time: 3 hours**

EXTERNAL QUESTION PATTERN

PART - A

10 Questions × 1Mark = 10 Marks

(Multiple Choice Questions)

PART - B

5 Questions × 5 Marks = 25 Marks

Answer All Questions

(Either Or Questions)

PART - C

4 Questions × 10 Marks = 40 Marks

Answer Any Four Questions

(Four Questions Out of Six)

RED RIBBON CLUB

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

Code : 20STPRR01 **Credits: 2***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Analyze the Objectives of Red Ribbon Club	PSO - 3, PSO - 5	K, A, E
CO - 2	Examine the need of Blood Identification	PSO - 3, PSO - 4 , PSO - 5	K, A, E
CO - 3	Understand the importance of Blood Donation	PSO - 3, PSO - 5	K, C, A, E
CO - 4	Recognise the importance of HIV Awareness	PSO - 3, PSO - 5	A, AP
CO - 5	Able to realize the need of field visit to AIDS centres	PSO - 1,PSO - 3 , PSO - 5	K, AP, S, E

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

Semester: I, II, III & IV				**RED RIBBON CLUB**							**Hours: 120**
Code : 20STPRR01											**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	4	4	4	4	4	5	4	3	5	4	4	4.09
CO - 2	4	3	4	5	4	5	3	3	5	4	4	4.00
CO - 3	4	3	4	5	4	5	3	3	5	3	4	3.90
CO - 4	4	3	4	5	4	5	3	3	5	3	4	3.90
CO - 5	4	3	4	5	4	5	3	3	5	4	4	4.00
Overall Mean Score												**3.98**

Result: The score for this course is **3.98** (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

Red Ribbon Club - Meaning -Vision - Objective - Popular colour - Symbol - Significance **(25 Hours)**

UNIT II

Blood Identification - Blood composition - Blood types - Methods for the identification of blood - Microscopic examination - Chemical methods - Spectrophoto - Metric Analysis - Immunological Methods - DNA analysis - Application of blood identification **(25 Hours)**

UNIT III

Blood Donation - Introduction - Benefits - Procedure - Importance of Blood Donation - Donors - Non-Donors - Donate Blood - Donation Process: Blood Banks - Outdoor camps - Registration - Medical Checkup - Donation - Refreshment **(25 Hours)**

UNIT IV

HIV Awareness**:** Definition - Causes - Effects**:** HIV Transmission - HIV Prevention - HIV Testing - Living with HIV - HIV Stigma **(25 Hours)**

UNIT V

Blood Donation Camp - Practical and Field Work: Blood Identification Camp - HIV AIDS Awareness Programme - Field visit to Jeevan Jothi - Aundipatti Government Hospital **(30 Hours)**

COURSE BOOKS:

- Books offered by Red Ribbon Club Committee Members

BOOKS FOR REFERENCE

1. S. Kartikeyan, R.N. Bharmal, R.P. Tiwari and P.S. Bisen. HIV and AIDS: Basic Elements and Priorities. Springer Publications. 2007.

"Everytwosecondssomeone NeedsbloodRedCrossurgesblooddonations." Http://www.redcross.org/news/article/il/chicago/Everytwosecondssomeone NeedsbloodRedCrossurgesblooddonations. Red Cross, n.d.

SCHEME OF EVALUATION

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

Scheme of Evaluation of Continuous Internal Assessment		
1.	*Test*	*15 Marks*
2.	*Field Visit*	*5 Marks*
3.	*Attendance*	*5 Marks*
Total		***25 Marks***

Total the marks of I, II, III & IV will be converted to 25 marks

Question Pattern for External Examination

Total Marks: 75 **Time: 2 hours**

Section - A

Answer All Questions 10 x 1 = 10 Marks

(Multiple Choice Questions)

Section - B

Answer All Questions 5 x 5 =25 Marks

(Either Or Questions)

Section - C

Answer Any Two Questions 2 x 20 = 40 Marks

(Two Questions Out of Three)

YOUTH RED CROSS
PROGRAMME OUTCOMES

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	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO - 1	Student will get a basic understanding of the origin, growth and development of humanity.	PSO - 1
PSO - 2	Will acquire basic knowledge about social subjects	PSO - 1, PSO - 2
PSO - 3	Could identify various social issues and problems	PSO - 3, PSO - 4
PSO - 4	Will help to build up a good career.	PSO - 1, PSO - 4
PSO - 5	Makes them aware of social responsibilities.	PSO - 1, PSO - 5

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	K
CO - 2	Identify the needs and problems of the community and involve them in problem-solving.	PSO - 2	C
CO - 3	Gain skills in mobilising community participation. Develop capacity to meet emergencies and social harmony.	PSO - 3	C
CO - 4	Educate and empower children and youth in the spirit of the Red Cross through constructive trainings and effective leadership	PSO - 4	AN
CO - 5	Provide opportunities for directing and harnessing their energies and idealism into worthwhile humanitarian activities	PSO - 5	AN

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

Semester: I - IV				**YOUTH RED CROSS**							**Hours: 120**
Code : 20STPRC01											**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	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	3	3	3.91
CO - 4	5	4	5	4	3	3	5	5	5	3	3	4.09
CO - 5	5	4	5	4	3	3	5	5	5	3	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: 20STPRC01

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:

Material Prepared By Parent Department

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.

SIGN OF YOUTH RED CROSS

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

Code: 20STPRC01 **Credits: 2***

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

International 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:

Material Prepared By Parent Department

BOOK FOR REFERENCE:

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

SCHEME OF EVALUATION

1.	Summative Examination (3 hours)	:	75 marks
2.	Continuous Internal Assessment	:	25 marks
	Total	**:**	**100 marks**

Scheme of Evaluation of Continuous Internal Assessment		
1.	*Attendance - 120 hours*	*10 Marks*
2.	*Field Visit*	*10 Marks*
3.	*Assignment*	*5 Marks*
Total		***25 Marks***

QUESTION PATTERN FOR SUMMATIVE EXAMINATION

Total Marks: 75 **Time: 3 hours**

EXTERNAL QUESTION PATTERN

PART - A

10 Questions × 1Mark = 10 Marks

(Multiple Choice Questions)

PART - B

5 Questions × 5 Marks = 25 Marks

Answer All Questions

(Either Or Questions)

PART - C

4 Questions × 10 Marks = 40 Marks

Answer Any Four Questions

(Four Questions Out of Six)

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
20CS1SD01	Computer Maintenance Hardware and Networking	2	1
20CS1SDP1	Computer Maintenance Hardware and Networking - Lab	2	1
Total (15 weeks x 4 = 60 Hours)		**4**	**2**

COMPUTER MAINTENANCE HARDWARE AND NETWORKING

Duration: One Year

Code : 20CS1SD01 **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	Acquire the basic knowledge of computer fundamentals.	PSO-1	K
CO-2	Explain the working principles of CPU, Motherboard, ROM and Power supply.	PSO-3	AN
CO-3	Connect the cables and peripheral devices.	PSO-3	AP
CO-4	Gain the knowledge of Operating System and File Systems.	PSO-2, 4	K
CO-5	Rectify the problems in assembling the computer components and software installation.	PSO-2, 5	AP

RELATIONSHIPMATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Code :20CS1SD01				**COMPUTER MAINTENANCE HARDWARE AND NETWORKING**							**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	3	3	3	3	4	4	4	4	4	3.45
CO-2	3	3	3	3	3	3	4	4	3	3	3	3.18
CO-3	3	3	3	3	3	3	4	4	4	4	4	3.45
CO-4	3	3	3	4	4	4	4	4	4	4	4	3.72
CO-5	4	4	4	4	4	4	3	3	3	4	4	3.72
Overall Mean Score												3.50

Result: The score for this course is: **3.5**(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: The development of the computer - Understanding Electronic Communication. **Understanding Electronic Communication:** Computer Communication - The Computer Bus. **An Overview of the Personal Computer:** The three stages of computing.

UNIT II

The Central Processing Unit: Microprocessors. **Power Supplies**: Power Supplies - Power Supply Problems. **Motherboard and ROM BIOS**: Computer Cases - Motherboards - ROM BIOS.

UNIT III

Cables: Types of Cables and Connectors**. Types of Printers. IDE (Intelligent drive Electronics) Devices. Modems and Video Subsystem.**

UNIT IV

BOOT. Operating System Fundamentals: Operating System Basics - File Systems.

UNIT V

Introducing and Installing Microsoft Windows: The Windows Family - Preparing for Windows Installation - Installing Windows. **Running Microsoft Windows**: How Windows 2007 works - How Windows 2010 Works.

BOOK FOR STUDY:

Study Material- by Parent Department.

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

Duration : One Year

Code : 20CS1SDP1 **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	Identify the computer parts and comprehend its functions	PSO-1	K
CO-2	Install RAM, Hard drive and Optical drives	PSO-5	AP
CO-3	Install system and application software	PSO-3	AP
CO-4	Understand the motherboard, BIOS and Storage devices features and its functions	PSO-5	K
CO-5	Assemble personal computer	PSO-5	AP

RELATIONSHIPMATRIX FOR COURSE OUTCOMES,PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Code :20CS1SDP1				**COMPUTER MAINTENANCE HARDWARE AND NETWORKING- LAB**						**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	3	3	3	3	4	4	4	4	4	3.45
CO-2	3	3	3	3	3	3	4	4	3	3	3	3.18
CO-3	3	3	3	3	3	3	4	4	4	4	4	3.45
CO-4	3	3	3	3	3	3	4	4	4	4	4	3.45
CO-5	4	4	4	4	4	4	3	3	3	4	4	3.72
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

1. Identification of Computer Parts and Connectors
2. Installing the Motherboard, CPU and Heat sinks
3. Installing RAM and Connecting the Power Supply
4. Installing Hard Drive, Optical Drives
5. Installing and configuring Scanner, Web Cam, Cell Phones
6. Installing Printer, Servicing and Troubleshooting
7. Understanding BIOS and Boot Orders
8. Preparing Hard disk to install OS
9. Install Chipset Drivers
10. Installing Application Software
11. Connecting Peripheral Devices
12. Assembling and disassembling of Laptop
13. Understanding Networks

OPEN SOURCE WEB DEVELOPMENT WITH LAMP-COURSE PATTERN

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

Code	Title of the Paper	Hours	Credit
20CS1SD02	Open Source Web Development With Lamp	2	1
20CS1SDP2	Open Source Web Development With Lamp - Lab	2	1
Total (15 weeks x 4 = 60 hours)		**4**	**2**

OPEN SOURCE WEB DEVELOPMENT WITH LAMP

Code: 20CS1SD02 **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	Understand and use open source software.	PSO - 1	U
CO - 2	Install and configure a Web platform (LAMP) used in web-site development.	PSO - 2	AP
CO - 3	Install and configure database server (MySQL) for use with PHP and Apache to provide interactive dynamical content for the web.	PSO - 2, PSO - 3	AP
CO - 4	Implement server side programming language (PHP), with dynamic content.	PSO - 3	AP
CO - 5	Acquire strategies and skills to develop interactive Websites and applications in the open source environment using Linux, Apache, MySQL and PHP (LAMP) technologies.	PSO - 4, PSO - 5	E

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

Code: 20CS1SD02	OPEN SOURCE WEB DEVELOPMENT WITH LAMP										Hours: 2 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	4	4	5	4	4	3	5	4	5	4	4.18
CO - 2	3	2	5	4	2	2	4	5	3	4	4	3.45
CO - 3	4	3	3	5	3	5	4	5	4	5	5	4.18
CO - 4	4	4	3	3	3	3	4	4	5	4	5	3.82
CO - 5	4	5	4	2	5	5	5	5	4	5	5	4.45
Overall Mean Score												**4.02**

Result: The score for this course is **4.02** (Very 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

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, Restarting apache 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. Jason Gerner, Elizabeth Naramore, Morgan L. Owens, Matt Warden, Professional LAMP Linux, Apache, MySql and PHP5 Web development , Wiley (2006).

2. Matt Doyle, Beginning PHP 5.3,Wiley (2010).

OPEN SOURCE WEB DEVELOPMENT WITH LAMP - LAB

Code: 20CS1SDP2 **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	Knowledge to install and setting up of LAMP environment.	PSO - 2	AP
CO - 2	Acquire idea about basic administration activities on Linux environment.	PSO - 1	AP
CO - 3	Developed and Tested simple PHP programs and Understood PHP built-in-functions.	PSO - 3	AN
CO - 4	Learnt to create database and tables and perform database operations.	PSO - 3, PSO - 4	AP
CO - 5	Hosted a website in the Web Server.	PSO - 3, PSO - 5	C
	Familiarity to create web application using LAMP.	PSO - 5	C

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

Code: 20CS1SDP2				**OPEN SOURCE WEB DEVELOPMENT WITH LAMP - LAB**							**Hours: 2** / **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	4	4	5	4	4	3	5	4	5	4	4.18
CO - 2	3	2	5	4	2	2	4	5	4	4	4	3.55
CO - 3	4	3	3	5	3	5	4	5	4	5	5	4.18
CO - 4	4	4	3	3	3	3	4	4	5	5	5	3.91
CO - 5	4	5	4	2	5	5	5	5	4	5	5	4.45
Overall Mean Score												**4.02**

Result: The score for this course is **4.02** (Very 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. 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.

SKILL DEVELOPMENT PROGRAMME (CERTIFICATE COURSE)

GANDHIAN THOUGHT

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-awareness, set and pursue meaningful goals, and develop positive personal qualities such as self-esteem, positive attitude, self-discipline and self-motivation.

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO - 1	Analyse the social, political, economic, cultural and religious conditions of the various dynasties of India, British India, Indian Constitution, Indian Administration and Indian Economy to acquire the special skill in the field of administration.	PO- 1, PO-2, PO-4
PSO - 2	Evaluate the History of World Civilizations and Europe in the world politics and compare the various types of constitution and the constitutional development in England.	PO- 1, PO-2
PSO - 3	Get knowledge on the principles of Economics, functions of banking system, development of Science and Technology, Tourism, the importance of Human Rights and equip with computer knowledge and applications for all competitive examinations.	PO- 1, PO-4, PO-5
PSO - 4	Recognize the sacrifice of the freedom fighters in the National Movement and picturize the traditional values in the right perception on Women Studies and Women Entrepreneurship.	PO- 1, PO- 5, PO- 6
PSO - 5	Participate in discussions by listening to others perspectives, asking productive questions, articulating original ideas, correspond efficiently with good vocabulary, realize the need of historical research and excel in General Studies for Competitive Examinations.	PO- 2, PO- 5, PO- 6

PAPER I: LIFE OF MAHATMA GANDHI - CCHYGT01

Code: CCHYGT01 **Hour: 1**
Credit: 1

COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain Knowledge on the Early Life of Mahatma Gandhi	PSO - 5	K
CO - 2	Analyse the racial equality and Mahatma Gandhi's Experience in South Africa	PSO - 5	An
CO - 3	Explain the role of Mahatma Gandhi in Indian Freedom Struggle	PSO - 2	Ap
CO - 4	Assess the constructive works of Mahatma Gandhi in Indian Nationalism	PSO - 2	Ap
CO - 5	Discuss the major Incidents from the Life of Mahatma Gandhi	PSO - 5	Ap

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

Code: CCHYGT01	PAPER I: LIFE OF MAHATMA GANDHI - CCHYGT01										Hours: 1 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	5	5	5	5	4	5	4	3	3	4.45
CO - 2	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 3	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 4	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 5	5	5	5	5	5	5	4	5	4	3	3	4.45
Overall Mean Score												**4.45**

Result: The score for this course is High

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

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.

PAPER II: NON VIOLENCE AND SARVODAYA - CCHYGT02

Code: CCHYGT02 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO- 1	Gain Knowledge on Mahatma Gandhi's Non - violence	PSO - 5	As
CO-2	Discuss the Policies of Mahatma Gandhi on Truth and Action	PSO - 5	An
CO-3	Analyse Sarvodaya and Antyodaya	PSO - 5	K
CO-4	Assess the values introduced through Brahmacharya and Aparigraha	PSO - 5	Ap
CO-5	Relate violence and Truth in our day today life with the teachings of Gandhiji	PSO - 2	Ap

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

Code: CCHYGT02				PAPER II: NON VIOLENCE AND SARVODAYA - CCHYGT02								Hour: 1 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	5	5	5	5	4	5	4	3	3	4.45
CO - 2	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 3	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 4	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 5	5	5	5	5	5	5	4	5	4	3	3	4.45
Overall Mean Score												4.45

Result: The score for this course is High

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

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.

RECOMMENDED BOOKS

PAPER I

Mahatma Gandhi	:	An Autobiography சத்திய சோதனை
R. Nanda	:	Mahatma Gandhi - A Biography
டி.டி. திருமலை	:	காந்தி
கல்கி	:	மாந்தருள் ஒரு தெய்வம்
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
பா. ஆனந்தி, மங்களவதி கேப்ரியல் & வி.ஏ. வித்யா	:	காந்திய சிந்தனை வினா-விடை (Gandhian Thought Quiz)
சி. பெரிதாய் & பா. ஆனந்தி	:	மகாத்மா காந்தியடிகளின் காலம்

PAPER II

M.K. Gandhi	:	Sarvodaya
————	:	Nonviolence in Peace and War (2 Vols)
————	:	Truth is God
Richard B. Gregg	:	Power of Nonviolence
மு. வசந்தா (பதி.)	:	சர்வோதயம்
R.R. Diwakar	:	The Saga of Satyagraha
ச. செயப்பிரகாசம்	:	அகிம்சை

COURSE BOOK:

மகாத்மா காந்தியின் வாழ்வும் அறவியலும் - டாக்டர் பா. ஆனந்தி & டாக்டர் ச. செயப்பிரகாசம்

Life and Values of Mahatma Gandhi - Dr. B. Ananthi & Dr. S. Jeyapragasam

தாள் I - மகாத்மா காந்தியின் வாழ்வு - CCHYGT01

Code: CCHYGT01 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO- 1	Gain Knowledge on the Early Life of Mahatma Gandhi	PSO - 5	K
CO-2	Analyse the racial equality and Mahatma Gandhi's Experience in South Africa	PSO - 5	An
CO-3	Explain the role of Mahatma Gandhi in Indian Freedom Struggle	PSO - 2	Ap
CO-4	Assess the constructive works of Mahatma Gandhi in Indian Nationalism	PSO - 2	Ap
CO-5	Discuss the major Incidents from the Life of Mahatma Gandhi	PSO - 5	Ap

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

Code: CCHYGT01	தாள் I - மகாத்மா காந்தியின் வாழ்வு - CCHYGT01										Hour: 1 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	5	5	5	5	4	5	4	3	3	4.45
CO - 2	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 3	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 4	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 5	5	5	5	5	5	5	4	5	4	3	3	4.45
Overall Mean Score												**4.45**

Result: The score for this course is High

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

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.

தாள் **II** - அகிம்சையும் சர்வோதயமும் - **CCHYGT02**

Code: CCHYGT02 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO- 1	Gain Knowledge on Mahatma Gandhi's Non - violence	PSO - 5	As
CO-2	Discuss the Policies of Mahatma Gandhi on Truth and Action	PSO - 5	An
CO-3	Analyse Sarvodaya and Antyodaya	PSO - 5	K
CO-4	Assess the values introduced through Brahmacharya and Aparigraha	PSO - 5	Ap
CO-5	Relate violence and Truth in our day today life with the teachings of Gandhiji	PSO - 2	Ap

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

	தாள் **II** - அகிம்சையும் சர்வோதயமும் - **CCHYGT02**											**Hour: 1**
Code: CCHYGT02												**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	5	5	5	5	4	5	4	3	3	4.45
CO - 2	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 3	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 4	5	5	5	5	5	5	4	5	4	3	3	4.45
CO - 5	5	5	5	5	5	5	4	5	4	3	3	4.45
Overall Mean Score												**4.45**

Result: The score for this course is High

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

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 **(Skills)** கற்றல் - அமைதி வழியில் சிக்கல் தீர்வு அனுபவங்கள் - சர்வசமய நட்புறவு, உரையாடல் மற்றும் வழிபாட்டு அனுபவம் பெறல்.

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.	Think critically, evaluate analytically and apply the expertise of their discipline worldwide.
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-awareness, set and pursue meaningful goals, and develop positive personal qualities.

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: 20GL1SD01 **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	K
CO - 2	Understand the various kinds of Reference sources available in the Library	PSO - 1	C
CO - 3	Get the analytical approaches to classify and Arrange the reading materials in Library	PSO - 2	An
CO - 4	Apply various methods to search the reading material and thereby get it at the earliest	PSO - 3	Ap
CO - 5	To Acquire knowledge about the managerial principles and techniques in Libraries.	PSO - 5	K

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

Code: 20GL1SD01				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: 20GL1SDP1 **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	Ap
CO - 2	Analyse the title according to Dewey Decimal Classification Scheme.	PSO - 2	An
CO - 3	Synthesis code for the book title according to colon Classification.	PSO - 5	S
CO - 4	Apply code for the book title according to Dewey Decimal Classification.	PSO - 2	Ap
CO - 5	Get practical approaches to search and download online resources.	PSO- 2	Ap

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

Code: 20GL1SDP1				**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 : 20GL1SD01		Practical Paper Code : 20GL1SDP1	
Internal	25 Marks	Internal	50 Marks
External	75 Marks	External	50 Marks
Total	**100 Marks**	**Total**	**100 Marks**

QUESTION PATTERN

THEORY PAPER - EXTERNAL QUESTION PATTERN - 75 MARKS

Part - A

Multiple Choice Questions 1 × 10 = 10 Marks

From all units

Part - B

Paragraph Questions - 4 out of 6 4 × 5 = 20 Marks

From all units

Part - C

Essay in 400 words - 3 out of 6 3 × 15 = 45 Marks

From all units

DEPARTMENT OF HINDI

PART I - HINDI - COURSE PATTERN (2020- 2023)

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

TESTING AND EVALUATION

Course	Continuous Internal Assessment	Semester Examination
Hindi	40%	60%

Continuous Internal Assessment

Continuous Assessment will be carried out by the Course Teachers. The components of CIA are as follows:

Components	Marks
Test -I	30
Test -II	30
Seminar/Quiz	10
Assignment	05
Attendance	05
Total	***80**

* The total internal marks obtained for 80 will be converted into marks obtained for 40.

HINDI - EXTERNAL QUESTION PATTERN

Time: 3 Hours **Marls: 60**

Section A: (One Word / Sentence) 10 x 1 = 10 Marks

Section B: (Paragraph / Annotation) 4 x 5 = 20 Marks

Section C: (Essay) 3x 10 = 30 Marks

PAPER I - PROSE, SHORT STORY AND GRAMMAR - I

Semester: I **Hours: 5**

Code : 20GH1GS01 **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

PAPER II - NOVEL, ONE ACT PLAY AND GRAMMAR - II

Semester: II **Hours: 5**

Code : 20GH2GS02 **Credits: 3**

1. **Novel** : Nirmala (Abridged version)

   by Premchand, Hamsa Prakashan Allahabad

2. **One Act Play** : Aadarsh Ekanki

   Published by Dakshina Bharath Hindi Prachar Sabha,

   Thyagaraya Nagar, Chennai - 600 017.

   The following Ekankies have been prescribed

   a) Doosra din - Kanchanlatha sabbarval

   b) Rajpoothri Ka badla - Divjendralal Rai

3. **Grammar** : 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

PAPER III - POETRY AND HISTORY OF HINDI LITERATURE, ALANKAR

Semester: III **Hours: 5**

Code : 20GH3GS03 **Credits: 3**

1. POETRY:

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

The following poems have been prescribed

1. Sachche Devtha - Ayodhya Singh Upadhyay Harioudh
2. Murjhaphool
3. Vivshtha
4. Badal - Sumitranandan Panth
5. Vasanth Aayaa
6. Deep Koi jal raha hai
7. Kabir Ke Dohe - 5 numbers
8. Tulasi Ke Dohe - 5 numbers
9. Raheem Ke Dohe - 5 numbers
10. Bihari Ke Dohe - 5 numbers

2. HISTORY OF HINDI LITERATURE:

Hindi Sahitya Ka Ithas by Rajanath Sharma Vinod Pushhak Mandir, Agra - 2

The following topics have been prescribed Salient features of Aadikl Bakthikal (Gyan marg, Premmag, Rambakthi, Krishnabakthi and Reethika.

Short Notes from Adunikkal**:** Chayavad, Pragathivad, Mythili Sharan, Gupta, Dinkar Premchand Pant Prasad, Ramachandra Shukla

3. ALANKAR:

Ras chand Alankar Chandrika Karnataka Mahila Hindi Seva Samithi, Chamarajpet, Bangalore - 560 008. The following Alankars have been prescribed Anupras, Yamak, Vakrokthi, Upama, Virodabhas.

PAPER - IV - GENERAL ESSAY, TECHNICAL HINDI, TRANSLATION AND LETTER WRITING

Semester: IV **Hours: 5**

Code : 20GH4GS04 **Credits: 3**

1. General Essay:

Nibandh Praveshika, Dakshin Bharath Hindi Prachar Sabha T.Nagar, Chennai - 600 017

The following Sahityotar (General) essay have been prescribed

a. Anushashan

b. Parishram Ka Mahatva

c. Paropkar

d. Bharat Ki Kalatmak Ekta

e. Nari Ka Karthavye Aur Adhikaar

2. Translation: Anuvad Abyas - III (1-5 Lessons) English to Hindi, Hindi to English Published by Dakshina Bharath Hindi Prachar Sabha T.Nagar, Chennai - 600 017.

3. Technical Hindi: Karyalaya Sahayika, Kendriya Sachivalaya Hindi Parishad NewDelhi, Hindi Vathayan

Dr. K. Chandra Mohan, Viswa Vidyalaya Prakashan Varanashi

Banking Terms	:	50 only
Nemikaryalaya Tippani	:	50 only
Name of the Ministries	:	33 only

4. Letter Writing: Pramanik Alekan Aur Tippan Prof Viraj M.A. Kashmirgate, Delhi - 110 006

PaariVarik Patra, Avedan Patra, Sampathak ke naam Patra, Padhadhikariyon ke naam Patra