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. PHYSICS

PG AND RESEARCH CENTRE OF PHYSICS

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 such as self-esteem, positive attitude, self-discipline, and self-motivation.

U.G. PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAM THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Assimilate basic knowledge in general Physics and apply the same in real time situation and Identify the principles of Physics behind the working of modern equipments	PO - 1
2.	Apply the underlying concepts and laws of Physics to the physical systems of the universe and its constituents and Formulate, solve and interpret Physics related problems in a systematic way	PO - 1
3.	Demonstrate the precise understanding of the theories and principles of Physics through experiments and Lay a foundation to interdisciplinary sciences for higher learning.	PO - 1, PO - 3
4.	Utilize the acquired knowledge to undertake independent project.	PO - 1, PO - 2
5.	Imbibe computational and Entrepreneur skills.	PO - 1, PO - 2

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

Sem.	Part	Code	Title of the Course	Hours	Credit
I	I	20GT1GS01/ 20GH1GS01/ 20GF1GS01	Tamil - I Hindi - I French - I	6	3
	II	20GE1GS01	English - I	6	3
	III	20PH1MC01	Mechanics and Properties of Matter	6	6
		20PH1CP01	Major Core Practical - I	3	-
		20MA1AC01	Allied Mathematics - I	5	4
	IV	20PH1AE01	**Ability Enhancement Compulsory Course (AECC)- 1:** Professional English	2	2
		20SE1CE1B	**Skill Enhancement Compulsory Course (SECC)-1:** Computer Education	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**	**20**
II	I	20GT2GS02 20GH2GS02 20GF2GS02	Tamil - II Hindi - II French - II	6	3
	II	20GE2GS02	English - II	6	3
	III	20PH2MC02	Heat and Thermodynamics	6	6
		20PH2CP01	Major Core Practical - I	3	3
		20MA2AC02	Allied Mathematics - II	5	4
	IV	20AE2ES02	**Ability Enhancement Compulsory Course (AECC) - 2:** Environmental Studies	2	2
		20SE2CB02	**Skill Enhancement Compulsory Course (SECC)- 2:** Capacity Building	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**	**23**

Sem.	Part	Code	Title of the Course	Hours	Credit
III	I	20GT3GS03 20GH3GS03 20GF3GS03	Tamil - III Hindi - III French - III	6	3
	II	20GE3GS03	English - III	6	3
	III	20PH3MC03	Optics and Spectroscopy	6	6
		20PH3CP02	Major Core Practical - II	3	2
		20CH3AC03	Allied Chemistry Theory - I	3	3
		20CH3AP03	Allied Chemistry Practical - I	2	1
		20PH3DE1A/ 20PH3DE1B/ 20PH3DE1C	**Discipline Specific Elective - 1** Laser and Fibre Optics/ Geometrical Optics/ Laser, Fibre Optics and Communication systems	4	3
	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
	III	20PH4MC04	Electromagnetism	6	6
		20PH4CP03	Major Core Practical - III	3	2
		20CH4AC04	Allied Chemistry Theory - II	3	3
		20CH4AP04	Allied Chemistry Practical - II	2	1
		20PH4DE2A/ 20PH4DE2B/ 20PH4DE2C	**Discipline Specific Elective - 2** Electricity/ Non-Conventional Energy Sources/ Atmosphere, weather and Climate	4	3
	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*
		20SLPEX01	**Service Learning Programme:** Extension JACEP	-	-
			Total	**30**	**21+2***

Sem.	Part	Code	Title of the Course	Hours	Credit
V	III	20PH5MC05	Atomic and Nuclear Physics	6	6
		20PH5MC06	Mathematical Physics	5	5
		20PH5MC07	Basic Electronics and Communications	5	5
		20PH5CP04	Major Core Practical - IV	3	2
		20PH5CP05	Major Core Practical - V	3	2
		20PH5DE3A/ 20PH5DE3B/ 20PH5DE3C	**Discipline Specific Elective - 3** Materials Science/ Biophysics/ Solid State Physics	4	3
	IV	20PH5GE01/ 20GE5NC01	**Generic Elective - 1 (NME)** Astrophysics/ NCC - National Integration and Personality Development	2	2
		20SE5AB03	**Skill Enhancement Compulsory Course (SECC) - 3:** Aptitude Building - I	2	2
	V	20SLPEX01	**Service Learning Programme:** Extension JACEP	-	2*
			Total	**30**	**27+2***
VI	III	20PH6MC08	Theoretical Physics	5	5
		20PH6MC09	Microprocessor	5	5
		20PH6MC10	Digital Electronics	5	5
		20PH6PR01	Project	2	2
		20PH6CP06	Major Core Practical - VI	3	2
		20PH6CP07	Major Core Practical - VII	2+1*	2
		20PH6DE4A/ 20PH6DE4B/ 20PH6DE4C	**Discipline Specific Elective - 4** Sound and Solar Energy / Home Appliances and Servicing Astronomy and Astrophysics	4	3
	IV	20PH6GE02/ 20GE6NC02	**Generic Elective - 2 (NME)** Digital Photography / NCC - Organization and Health Programme in NCC	2	2
		20SE6PH04	**Skill Enhancement Compulsory Course (SECC) - 4:** Workshop Practice	2	2
	V	20PH6SS01/ 20PH6SS02/ 20PH6SS03/ 20PH6SS04/ 20PH6SM01	**Self Study Course:** Biomedical Instrumentation/ Particle Accelerators and detectors/ Applications of Solar Energy / How things Work MOOCs	-	2*
			Total	**30+1***	**28+2***
			Total	**180+1***	**140+6***

*** Extra Credits - Self Study Paper, MOOCs**

ALLIED CORE COURSE OFFERED BY DEPARTMENT OF PHYSICS

Sem.	Code	Title of the Course	Hours	Credit
I	20PH1AC01	Allied Physics Theory - I Mechanics, Properties of Matter and Thermal Physics	3	3
	20PH1AP01	Allied Physics Practical - I	2	1
II	20PH2AC02	Allied Physics Theory - II Electricity and Electronics	3	3
	20PH2AP02	Allied Physics Practical - II	2	1
III	20PH3AC01	Allied Physics Theory - I Mechanics, Properties of Matter and Thermal Physics	3	3
	20PH3AP01	Allied Physics Practical - I	2	1
IV	20PH4AC02	Allied Physics Theory - II, Electricity and Electronics	3	3
	20PH4AP02	Allied Physics Practical - II	2	1

CERTIFICATE COURSE

Code	Title of the Course	Hours	Credit
20PH1SD01	**Skill Development Programme (SDP)** Mobile Technology	60	2

CERTIFICATE COURSE ON GANDHIAN THOUGHT

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

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA)

THEORY

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

Continuous Internal Assessment Component (CIA)

Practical can be decided by the respective Dept.

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)

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 atleast one Question from each Unit)

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)

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				**ENGLISH FOR COMMUNICATION -I**							**Hours: 6**
Code : 20GE1GS01											**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 = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos = Total of Mean Scores / 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

MECHANICS AND PROPERTIES OF MATTER

Semester: I **Hours: 6**

Code : 20PH1MC01 **Credits: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Explain the basic principles of force and energy	PSO-1, PSO-2	K, C, An
CO - 2	Analyze the mechanics of rigid bodies and compute the moment of inertia	PSO-2	K, C, An
CO - 3	Express the laws of gravitation and its effects.	PSO-2, PSO-4	K, C, Ap
CO - 4	Experiment the different elastic properties of materials	PSO-2, PSO-3, PSO-4	K, Ap
CO - 5	Illustrate the phenomena of viscosity and surface tension of fluids.	PSO-1, PSO-4	K, An, Ap

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

Semester : I				**MECHANICS AND PROPERTIES OF MATTER**							**Hours: 6**
Code : 20PH1MC01											**Credits: 6**
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**	
CO1	4	4	3	2	3	3	4	5	3	4	4	3.54
CO2	5	4	4	3	3	3	4	5	4	3	2	3.63
CO3	5	4	3	4	3	3	4	4	3	3	2	3.45
CO4	4	4	3	4	3	2	4	4	4	3	2	3.36
CO5	4	4	4	4	2	3	3	4	4	2	3	3.18
Overall Mean Score												**3.43**

Result: The Score for this Course is 3.43 (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: GRAVITATION AND MOMENT OF INERTIA

Newton's law of gravitation – Kepler's laws of planetary motion – Determination of G-Boy's experiment – Gravitational field and gravitational potential – Gravitational potential and field due to a spherical shell – Gravitational potential and field due to a solid sphere – Variation of g with latitude or rotation of the earth – Variation of g with altitude – Variation of g with depth - The compound pendulum.

Perpendicular axes theorem – Theorem of parallel axes – Moment of inertia of a thin circular ring – Moment of inertia of a circular disc– Moment of inertia of a cylinder – M.I. of a hollow cylinder about an axis passing through the Centre and perpendicular to the length of the cylinder – M.I. of a hollow cylinder about its own axis – Moment of inertia of a solid sphere – M.I. of a hollow sphere about its diameter – Determination of the moment of inertia of a fly-wheel. **(18 Hours)**

UNIT II: IMPACT OF ELASTIC BODIES, PROJECTILE MOTION AND MECHANICS OF A RIGID BODY

Impulse of a force –Collision – Oblique impact of a smooth sphere on a fixed smooth plane – Direct impact of two smooth spheres – Loss of K.E. due to direct impact of two smooth spheres – Oblique impact of two smooth spheres – Loss of K.E. due to oblique impact. Range on an inclined plane – Range and time of flight down an inclined plane – Velocity of projection and a given range on the inclined plane for the maximum range – Two-body problem and the reduced mass – Bifilar pendulum-parallel threads – M.I. of a rectangular block.

Moment of inertia of a uniform rod – Moment of inertia of a rectangular lamina – Moment of inertia of an annular ring or disc – Moment of inertia of a spherical shell – Kinetic energy of a rotating body – Moment of inertia of a triangular lamina – Angular momentum – Relation between torque and angular momentum - Angular momentum of a system of particles – Conservation of angular momentum.

(18 Hours)

UNIT III: SYSTEM OF PARTICLES, CENTRE OF GRAVITY, CETRE OF PRESSURE AND FRICTION

Centre of mass, motion of Centre of mass, systems with varying mass Centre of gravity of a right solid cone-solid hemisphere-hollow semi sphere -Thrust on a plane surface -Centre of pressure -rectangular lamina, Laws of static friction-experimental method for determining coefficient of friction between two surfaces-equilibrium of a body on a rough inclined plane acted by external force.

(18 Hours)

UNIT IV: ELASTICITY AND VISCOSITY

Different moduli of elasticity – Relation between angle of shear and linear strain – Relation between volume strain and liner strain – Work done in a strain – Behaviour of a wire under progressive tension – Relation between the elastic moduli – Determination of Poisson's ratio υ for rubber – Torsion of a body - Determination of rigidity modulus- Static torsion method – Work done in a twisting a wire - Torsional oscillations of a body - Expressions for the bending moment - Depression of the loaded end of a cantilever – Measurement of E - Oscillations of a cantilever - Depression at the mid-point of a beam laded at the middle -Uniform bending of a beam - Measurement of Young's modulus by bending of a beam - Searle's method of determining E,G & υ- Konig's method.

Streamline flow and turbulent flow -Poiseuilles formula for the flow of liquid through a capillary tube - Corrections to Poiseuille's formula - Poisseuille's method for determining coefficient of viscosity of a liquid - Ostwald' viscometer—Poiseuille's method for determining coefficient of viscosity - Terminal velocity and Stokes' formula - Stokes' method for the coefficient of viscosity - Variation of viscosity with temperature and pressure – Friction and lubrication. Searle's viscometer – Viscosity of gases – Rankine's method for determination of η of a gas.

(18 Hours)

UNIT V: SURFACE TENSION AND HYDRODYNAMICS

Explanation of surface tension on kinetic theory – Work done in increasing the area of a surface – Work done in blowing a bubble – Forms of liquid drops – Angle of contact – Spreading of one liquid over another – Pressure difference across a liquid surface – Excess pressure inside a curved liquid surface – Force between two plates separated by a thin layer of a liquid – Jaegar's method – Variation of surface tension with temperature – Quincke's method – Vapour pressure over flat and curved surfaces – Determination of S.T. by Ripple's method (Rayleigh's method) – Experimental study of the variation of surface tension with temperature – Drop-weight method of determining the surface tension of a liquid – Experiment to determine the interfacial tension between water and kerosene.

Equation of continuity – Energy of the liquid – Euler's equation for unidirectional flow – Bernoulli's theorem. **(18 Hours)**

BOOKS FOR STUDY:

R. Murugeshan - Properties of Matter, Fifth Edition (Reprint 2018) – S Chand and Company Limited

DETAILED REFERENCE:

R. Murugeshan - Properties of Matter, Fifth Edition (Reprint 2018) – S Chand and Company Limited

UNIT I – Chapter 6, 7

UNIT II –Chapter 8,9, 10

UNIT III –Chapter 19,20,21,22

UNIT IV – Chapter 1, 2

UNIT V – Chapter 3, 4

BOOKS FOR REFERENCE:

1. Mechanics – Prof. D.S Mattur, Revised by: Dr.P.S. Hemne. S. Chand and Co. New Delhi. First edition 1981, Reprint 2015.
2. Properties of Matter – Brij Lal and Subramanyam. Eurasia publishing house (Pvt) Ltd, New Delhi. Sixth Edition 1991.

MAJOR PRACTICAL I

Semester: I & II **Hours: 3 +3**

Code : 20PH1CP01& 20PH2CP01 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Compute the parameters of mechanics and properties of matter through experiential learning.	PSO-1, PSO-2, PSO-3	K, Ap, An
CO - 2	Construct simple electric circuits through different experiments,	PSO-2, PSO-3	K, Ap, An
CO - 3	Verify the fundamental laws of sound.	PSO-1, PSO-2, PSO-3	K, C, Ap

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

Semester : I & II						**MAJOR PRACTICAL I**					**Hours: 3+3**
Code : 20PH1CP01& 20PH2CP01											**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**	
CO1	4	4	5	3	3	3	4	5	4	3	3	3.71
CO2	3	4	5	3	2	2	4	4	5	3	3	3.45
CO3	3	4	5	3	2	3	3	4	5	3	2	3.72
Overall Mean Score												**3.62**

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

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any 14)

1. Young's Modulus- Uniform Bending - Pin and Microscope.
2. Young's Modulus- Uniform Bending - optic lever- Telescope and Scale method.
3. Young's Modulus- Non Uniform Bending - optic lever- Telescope and Scale method.
4. Young's Modulus- Non Uniform Bending - Pin and Microscope.
5. Torsion Pendulum- Rigidity modulus.
6. Compound Pendulum - Determination of g.
7. Comparison of Capacitances of capacitors using BG
8. Comparison of e.m.f 's two cells using BG
9. Low range Voltmeter Calibration using Potentiometer.
10. Spectrometer- Refractive Index and Dispersive power of the Prism
11. Spectrometer - Normal Incidence and Dispersive power of the grating
12. Determination of frequency by Melde's String apparatus
13. Calibration of Ammeter using Potentiometer.
14. Determination of self-inductance of a coil by Owen's Bridge
15. Determination of co-efficient of Viscosity by Stoke's Method
16. Determination of frequency of AC mains using Sonometer.
17. Determination of self-inductance of a coil by De-Sauty's bridge
18. Determination of surface tension by capillary rise method.

ALLIED MATHEMATICS - I

Semester: I **Hours: 5**

Code : 20MA1AC01 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Solve the problems in differentiation.	PSO - 2	C
CO - 2	Evaluate the double integrals by changing the order of integration.	PSO - 4	E
CO - 3	Acquire the knowledge about fourier series.	PSO - 2	S
CO - 4	Identify the relation between roots and coefficients of equations.	PSO - 3	Ap
CO - 5	Analyze the concepts of transformation of equations.	PSO - 2 , PSO - 4	An

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

Semester : I				**ALLIED MATHEMATICS - I**							**Hours: 5**
Code : 20MA1AC01											**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**	
CO1	3	3	4	3	3	3	3	4	3	3	3	3.18
CO2	4	3	3	3	3	3	3	3	3	4	3	3.18
CO3	4	3	3	3	3	3	3	4	3	3	3	3.18
CO4	4	3	3	4	3	3	3	3	4	3	3	3.27
CO5	3	4	3	3	3	3	3	4	3	4	3	3.27
Overall Mean Score												**3.21**

Result: The Score for this Course is 3.21 (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

Successive differentiation - n^{th} derivative - standard results - Leibnitz formula for n^{th} derivative – Jacobians. **(15 Hours)**

UNIT II

Multiple integrals - double integrals - changing the order of integration in double integrals - double integral in polar coordinates. **(15 Hours)**

UNIT III

Fourier series - Fourier coefficients - the cosine and sine series. **(15 Hours)**

UNIT IV

Theory of equations: Relation between roots and coefficients - Reciprocal equations. **(15 Hours)**

UNIT V

Transformation of equations -approximate solutions of numerical equations: Newton's method - Horner's method. **(15 Hours)**

COURSE BOOK:

Course material compiled by the Department.

BOOKS FOR REFERENCE :

1. S. Arumugam and A. Thangapandi Isaac, Ancillary Mathematics Paper I, New Gamma Publishing House, 1996.
2. S. Arumugam and A.Thangapandi Isaac, Ancillary Mathematics Paper III, New Gamma Publishing House, 2002.

PROFESSIONAL ENGLISH

Semester: I **Hours: 2**

Code : 20PH1AE01 **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 : 20PH1AE01											**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 III: 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

COURSE BOOK:

- *English for Physical Sciences* by Tamil Nadu State Council for Higher Education

INTERNAL ASSESSMENT	
COMPONENTS	**MARKS**
Test-I	30
Test-II	30
Listening Comprehension	10
Reading Comprehension	10
Language lab (Speaking skills)	10
Assignment	10
Total	**100**

PROFESSIONAL ENGLISH - 20PH1AE01

QUESTION PATTERN

Time: 1 Hour **Max. Marks: 30**

I.	Match the following	10
	or	
	True or False	
II.	Writing Definition	5
	or	
	Transcript of a passage	
III.	Sketch mind maps for the following	10
	or	
	Essay Writing	
IV.	Comprehension on short talks	5
	or	
	Writing Recommendations	

STREAM - B

COMPUTER EDUCATION

(for B. Sc. Mathematics, Physics and Chemistry Programmes)

Semester: I **Hours: 2**

Code : 20SE1CE1B **Credits: 2**

COURSE OUTCOMES:

- Handle the tools of MS office
- Create animations, presentations and documents
- Prepare spreadsheets using MS Excel for various applications
- Develop computational skills and apply Google Apps for ICT learning
- Use DTP skills to become an Entrepreneur.

MICROSOFT OFFICE 2017

MS WORD: (Word processing software)

1. Formatting
2. Table Creation
3. Mail Merge
4. Preparation of advertisement using drawing tool

MS EXCEL: (Electronic spread sheets)

1. Excel Function (statistical)
2. Data filtering and sorting
3. Mark sheet, pay bill Preparation
4. Data analysis using chart

MS POWERPOINT: (Presentation)

1. Theme - based presentation with Animation Effects
2. PPT Record Narration

MOBILE APPLICATIONS I:

1. Gmail
2. Cloud based callendar, mail
3. Google docs
4. Google groups

MOBILE APPLICATIONS II:

1. E books
2. Video chat, online chat
3. Cloud storage
4. Form creation
5. Assistant

COURSE BOOK:

Study Material prepared by Mathematics, Physics and Chemistry.

BOOKS FOR REFERENCE:

1. D. P. Nagpal - Computer Fundamentals - S. Chand & Company Ltd, New Delhi - 1999.
2. V. Rajaraman - Fundamentals of Computers, 3rd edition - Prentice Hall of India Private Limited - 2001.
3. B. Ram - Computer Fundamentals, 3rd edition - New Age International Pvt. Ltd – 2010
4. Web resources

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

HEAT AND THERMODYNAMICS

Semester: II **Hours: 6**

Code : 20PH2MC02 **Credits: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify and analyze the behaviour of ideal and real gases	PSO-1, PSO-2	K, C, An
CO - 2	Distinguish various transport phenomena	PSO- 1	K, C
CO - 3	Apply the laws of thermodynamics to heat engines	PSO- 1, PSO-3, PSO-4	K, C, AP
CO - 4	Evaluate entropy changes for various thermodynamic systems	PSO-1, PSO- 3	K, C, An
CO - 5	Derive thermo dynamical relations	PSO- 1, PSO- 2	K, C

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

Semester: II				**HEAT AND THERMODYNAMICS**							**Hours: 6**
Code : 20PH2MC02											**Credits: 6**
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**	
CO1	5	4	3	2	3	3	5	5	4	3	2	3.55
CO2	5	3	3	2	2	2	5	3	3	2	2	2.90
CO3	5	4	3	2	3	2	5	5	5	3	2	3.55
CO4	5	4	4	3	3	2	5	5	3	2	2	3.45
CO5	5	4	4	2	2	2	5	5	5	2	2	3.45
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: BEHAVIOUR OF IDEAL GASES

Kinetic model - Pressure exerted by a gas - RMS speeds of molecules - Boyle's law - Energy per unit volume of a gas - Gas equation - Gas laws - Avogadro's hypothesis - Graham's law of diffusion of gases - RMS velocity as a function of temperature - Degrees of freedom - Maxwell's law of equipartition of energy - Relation between molar specific heats and degrees of freedom - Specific heats of mono, di and polyatomic gas - Experimental and Theoretical agreement of C_p, C_v and γ - Behaviour of specific heats at low temperature - Adiabatic expansion of an ideal gas - Kinetic interpretation of temperature - Change of pressure with height - Application to Atmospheric Physics. **(18 Hours)**

UNIT II: REAL GASES AND TRANSPORT PHENOMENA

Critical Constants - Behaviour of gases at high pressure - Boyle's Temperature - Vander Waal's Equation of state - Constants and Limitations - Critical Co-efficient - Joule Thomson Effect - Porous Plug Experiment - Regenerative Cooling - Joule-Kelvin Effect - Relation between Boyle's Temperature, Temperature of Inversion and Critical Temperature. Viscosity - Effect of Temperature and Pressure - Thermal conductivity - Effect of Temperature and Pressure - Relation with viscosity - Largest thermal conductivity of hydrogen - Diffusion - Effect of Temperature and Pressure - Relation with viscosity. **(18 Hours)**

UNIT III: THERMODYNAMIC SYSTEM

Zeroth law of thermodynamics - Concept of heat - Thermodynamic Equilibrium - Work: A Path Dependent Function - Internal Energy (U) - First law of Thermodynamics - Internal Energy as a State Function - Specific Heats of a Gas - Applications of first law of thermodynamics - Indicator diagram - Work done during an Isothermal and Adiabatic process - Slopes of Adiabatics and Isothermals - Relation between Adiabatic and Isothermal Elasticities - Reversible and Irreversible Process - Heat engines - Definition of Efficiency - Carnot's Cycle - Carnot's Engine and Refrigerator - Co-efficient Performance - Second law of Thermodynamics - Carnot's theorem. **(18 Hours)**

UNIT IV: ENTROPY

Concept of Entropy - Change in Entropy - Adiabatic Process, Reversible and Irreversible Cycles - Principle of Increase of Entropy - Temperature-Entropy diagram - Physical Significance - Entropy of a Perfect Gas and Steam – Kelvin's Thermodynamic Scale of temperature - Size of a degree – Zero of Absolute or Thermodynamic Scale - Identity of Perfect Gas Scale and Absolute Scale - Third law of thermodynamics - Zero point energy - Negative temperature. **(18 Hours)**

UNIT V: THERMODYNAMICAL RELATIONSHIPS

Thermodynamical variables - Extensive and Intensive Variables - Maxwell's thermodynamical equations - Applications - Thermodynamic Potentials - Significance - Relation of Thermodynamical Potentials with their variables - Relations between C_p, C_v and μ - Tds Equations - Clapeyron's Latent Heat Equation - Entropy and the Second law of thermodynamics - Joule-Kelvin Co-efficient - Equilibrium between Liquid and its Vapour - First and Second Order Phase Transitions - Emf of a reversible cell. **(18 Hours)**

BOOK FOR STUDY:

Brijlal, N. Subrahmanyam and P. S. Hemne - Heat, Thermodynamics and Statistical Physics (Reprint 2014) - S. Chand & Company Pvt. Ltd., New Delhi.

DETAILED REFERENCE:

Brijlal, N. Subrahmanyam and P. S. Hemne - Heat, Thermodynamics and Statistical Physics (Reprint 2014) - S. Chand & Company Pvt. Ltd., New Delhi.

UNIT I: Chapter 1: 1.3 to 1.12, 1.18 to 1.27

UNIT II: Chapter 2: 2.4 to 2.13, 2.20 to 2.25, Chapter 3: 3.7 to 3.18

UNIT III: Chapter 4: 4.1 to 4.15, 4.20 to 4.29

UNIT IV: Chapter 5: 5.1 to 5.17

UNIT V: Chapter 6: 6.1 to 6.11, 6.15 to 6.20

BOOKS FOR REFERENCE:

1. D.S. Mathur - Heat and Thermodynamics - Sultan Chand & Sons, New Delhi - 2008.
2. A. K. Saxena and C. M. Tirwari - Heat and Thermodynamics - Alpha science International Ltd, Oxford, United Kingdom - 2014.
3. Sidharth Sharma - Heat and Thermodynamics - Mohit Books International, Central Delhi - 2012.
4. V. N. Dass - Heat and Thermodynamics - Dominant Publishers & Distributors(P) Ltd., New Delhi - 2013.
5. Francis W. Sears and Gerhard L. Salinger - Thermodynamics, Kinetic theory and Statistical Thermodynamics - Narosa Book Distributors, New Delhi - 1998.

ALLIED MATHEMATICS - II

Semester: II **Hours: 5**

Code : 20MA2AC02 **Credits: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the methods of solving linear differential equations with variable coefficients.	PSO - 1, PSO - 5	K
CO - 2	Solve ordinary differential equations using Laplace and inverse Laplace transform.	PSO - 2	E
CO - 3	Formulate and solve partial differential equations using some standard forms.	PSO - 2 , PSO - 3	S
CO - 4	Compute vector integration and vector differentiation.	PSO - 4	Ap
CO - 5	Apply the concept of line and surface integrals in solving double and triple integrals.	PSO - 2	Ap, S

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

Semester : II				**ALLIED MATHEMATICS - II**							**Hours: 5**
Code : 20MA2AC02											**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**	
CO1	4	3	3	3	3	3	4	3	3	3	4	3.27
CO2	4	3	4	3	3	3	3	4	3	3	3	3.27
CO3	3	4	3	3	3	3	3	4	4	3	3	3.27
CO4	4	3	3	4	3	3	3	3	3	4	3	3.27
CO5	3	3	3	4	3	3	3	4	3	3	3	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 = Total of Values / Total No. of Pos & PSOs	Mean Overall Score for Cos = Total of Mean Scores / Total No. of Cos

UNIT I

Homogeneous linear equations of second order - linear equations with variable coefficients - variation of parameters. **(15 Hours)**

UNIT II

Laplace transform - Definitions - Theorems on Laplace transforms - Evaluation certain integrals using Laplace Transform - inverse Laplace transform. Solving ordinary differential equations using Laplace transform. **(15 Hours)**

UNIT III

Partial differential equations - formation of PDE - methods of solving first order PDE - some standard forms. **(15 Hours)**

UNIT IV

Vector differentiation - Vector differential operator - gradient - Directional derivative - divergence and curl - Solenoidal and irrotational vectors. **(15 Hours)**

UNIT V

Vector integration - line integrals - surface integrals - theorems of Green, Gauss and Stokes (problems only). **(15 Hours)**

COURSE BOOK:

Course material compiled by the Department

BOOKS FOR REFERENCE :

1. S. Arumugam and A. Thangapandi Issac, Ancillary Mathematics Paper II, New Gamma Publishing House, 1996.
2. S. Arumugam and A. Thangapandi Issac, Ancillary Mathematics Paper III, New Gamma Publishing House, 1997.

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

OPTICS AND SPECTROSCOPY

Semester: III **Hours: 6**

Code : 20PH3MC03 **Credits: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain the nature of light waves.	PSO - 1, 3	K, Ap
CO-2	Elucidate the types of diffraction.	PSO - 1	U
CO-3	Illustrate the resolving power of different optical instruments.	PSO - 3	Ap
CO-4	Describe the concept of polarization and its applications.	PSO - 2	An
CO-5	Discuss the basic concepts of molecular spectroscopy.	PSO - 1, 2	K, An

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

Semester: III				**OPTICS AND SPECTROSCOPY**							**Hours:6**
Code : 20PH3MC03											**Credits:6**
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	5	2	2	2	4	5	5	2	2	3.36
CO-2	4	3	2	2	2	2	4	4	3	2	2	2.74
CO-3	5	4	4	2	2	2	5	5	4	3	2	3.45
CO-4	5	4	4	2	2	2	5	5	4	3	2	3.45
CO-5	4	3	3	2	2	2	5	4	4	2	2	3.18
Overall Mean Score												**3.23**

Result: The score for this course is **3.23** (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 = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I: INTERFERENCE

Light waves - Superposition of waves - Interference - Conditions for interference - Theory of interference - Intensity distribution - Superposition of incoherent and many coherent waves - Young's double slit experiment - Coherence - Conditions for interference - Fresnel biprism - Interference due to reflected light - Conditions for maxima and minima - Interference due to transmitted light - Wedge shaped film - Colors in thin films - Newton's rings - Michelson's interferometer - Applications of Michelson's interferometer. **(18 Hours)**

UNIT II: DIFFRACTION

FRESNEL DIFFRACTION

Huygens - Fresnel's theory - Fresnel's assumptions - Rectilinear propagation of light - Zone plate - Action of Zone plate - Differences - Fresnel and Fraunhofer types of diffraction - Diffraction at a circular aperture - Narrow slit.

FRAUNHOFFER DIFFRACTION

Fraunhoffer diffraction at a single slit - Circular aperture - Plane diffraction grating - Theory - Determination of wavelength of light - Dispersive power of grating. **(18 Hours)**

UNIT III : RESOLVING POWER

Resolving power - Rayleigh's criterion - Limit of resolution of the eye and convex lens - Resolving power of optical Instruments - Criterion for resolution - Resolving power of a telescope and microscope - Resolving power of a prism and grating.

(18 Hours)

UNIT IV: POLARIZATION

Natural light - Polarized light - Calcite crystal - Optic axis - Principal section - Double refraction - Huygen's explanation - Positive and negative crystals - Phase difference between o-ray and e-ray - Types of polarized light - Quarter wave plate - Half wave plate - Production and detection of polarized lights - Optical activity - Fresnel's theory - Experimental verification - Specific rotation - Polarimeter - LCD. **(18 Hours)**

UNIT V: SPECTROSCOPY

Origin and nature of molecular spectra - Different modes of molecular excitation - Factors affecting molecular spectra - Born-Oppenheimer approximation - Rotation of linear system - Rotational spectra of rigid and non rigid molecules - Energy of a diatomic molecule - The energy of a diatomic molecule and harmonic oscillator - Infrared Spectra - Pure rotational spectra of a molecule - Vibration-rotation spectra of a molecule - Electronic spectra of a molecule - Rayleigh's scattering - Raman effect - Experimental study of Raman effect - Quantum theory of Raman effect - Applications - Laser Raman spectroscopy - Fluorescence and Phosphorescence. **(18 Hours)**

BOOKS FOR STUDY:

1. Subramaniyam and Brijlal - A Text book of Optics, 23rd edition - S. Chand & Company, New Delhi - 2006.
2. R. Murugeshan & Kiruthiga Sivaprasath - Modern Physics, 17th Edition - S. Chand & Company, New Delhi - 2013.

DETAILED REFERENCE:

1. Subramaniyam and Brijlal - A Text book of Optics, 23rd edition - S. Chand & Company, New Delhi - 2006.

   UNIT I : Chapter 14: 14.1-14.9.4,Chapter 15: 15.2.1-15.2.3, 15.3, 15.5-15.6.7-15.7-15.8.5

   UNIT II : Chapter 17: 17.1-17.8.2, Chapter 18: 18.2-18.2.1, 18.3, 18.7-18.7.7

   UNIT III: Chapter 19: 19.1-19.8,19.11,19.12

   UNIT IV : Chapter 20: 20.1-20.5.1.1, 20.5.5-20.6.1, 20.6.3, 20.8-20.9.2, 20.13, 20.15, 20.17.1-20.20, 20.24-20.26, 20.30
2. R. Murugeshan & Kiruthiga Sivaprasath - Modern Physics, 17th Edition - S. Chand & Company, New Delhi - 2013.

   UNIT V: Chapter 23: 23.1 - 23.12

   Chapter 19: 19.6 -19.15

   Chapter 21: 21.2

BOOKS FOR REFERENCE:

1. R. Murugeshan and Kiruthiga Sivaprasath - Optics and spectroscopy - S. Chand Publishing Group, New Delhi - 2010.
2. Ghatak and Thiagarajan - Optical Electronics - Cambridge University Press - 2011.
3. G. Aruldhas - Molecular Structure and Spectroscopy, 12th edition - PHI Learning Pvt. Limited - 2011.

MAJOR CORE PRACTICAL - II

Semester: III **Hours: 3**

Code : 20PH3CP02 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Determine the optical constants through experiments based on properties of light.	PSO - 3	Ap
CO-2	Construct the circuits to determine the electric and magnetic properties of materials.	PSO - 3	Ap

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

Semester: III				**MAJOR CORE PRACTICAL - II**							**Hours: 3**
Code : 20PH3CP02											**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	5	2	2	2	4	4	5	3	2	3.45
CO-2	5	4	5	2	2	2	4	4	5	3	2	3.45
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any Eight)

1. Determination of Refractive index of the prism using spectrometer.
2. Measurement of dispersive power of the prism using spectrometer.
3. Determination of wavelength of spectral lines using grating - Normal Incidence method
4. Comparison of Mutual inductances of the coils.
5. Determination of self inductance of the coil - Anderson's Bridge method.
6. Determination of the earth's magnetic field - Field along the axis of a coil
7. Determination of the thickness of the given thin wire - Air wedge.
8. Determination of the frequency of an electrically maintained tuning fork by Melde's String.
9. Determination of Resistance and Resistivity of a wire- Carey Foster's bridge.
10. Estimate the specific rotation of sugar solution using polarimeter.

ALLIED: GENERAL CHEMISTRY-I

Semester: III **Hours: 3**

Code : 20CH3AC03 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire knowledge about modern periodic table and periodic properties	PSO - 2	K, U
CO - 2	Describe the different types of bonding	PSO - 1	K, U
CO - 3	Explain the different types of the reactions	PSO - 2	U, C,
CO - 4	Recognize the separation techniques using chromatography and thermal analysis	PSO - 2, PSO - 4	U, E, An, Ap
CO - 5	Gain knowledge about the fundamentals of chemical kinetics	PSO-2	U, An, K

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

Semester: III				**ALLIED: GENERAL CHEMISTRY-I**							**Hours: 3**
Code : 20CH3AC03											**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	3	3	3	3	4	4	4	3	4	4	3.45
CO - 2	3	3	4	3	4	3	3	3	4	4	4	3.45
CO - 3	4	3	3	3	4	3	4	3	3	3	4	3.36
CO - 4	4	4	4	3	3	3	3	4	4	4	4	3.63
CO - 5	4	3	4	3	4	3	3	4	4	3	4	3.55
Overall Mean Score												**3.49**

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

Note:

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

Values Scaling:

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

UNIT I

PERIODIC TABLE:

Modern periodic table - groups and periods - rules to write electronic configuration - classification of elements on the basis of electronic configuration - characteristics of s, p, d and f block elements - causes and consequences of lanthanide contraction - periodic properties of elements: atomic radii, ionic radii, ionization energy, electron affinity and electronegativity - trends in periodic table **(9 Hours)**

UNIT II

CHEMICAL BONDING:

Definition, general properties of electrovalent and covalent compounds - differences between electrovalent and covalent compounds - structure of NaCl, diamond and graphite - hydrogen bonding: definition, classification and applications - shapes of atomic orbitals - difference between orbit and orbital - s-s, s-p and p-p overlap - difference between sigma and pi bonds - Valence Bond theory (VB) - postulates of VB theory - application for the formation of simple molecules: H_2, HF, Cl_2 - Molecular Orbital theory (MO) - MO diagram: H_2, He_2, N_2, O_2 and F_2 molecules **(9 Hours)**

UNIT III

a) DETECTION OF ELEMENTS AND TYPES OF REACTIONS:

Detection of nitrogen, sulphur and halogens in organic compounds - homolytic and heterolytic bond breaking - types of reagents: electrophilic reagents and nucleophilic reagents - definition - examples - types of organic reactions: substitution, addition, rearrangements and elimination reactions - definition - examples

b) ORGANOMETALLIC COMPOUNDS:

Definition - preparation and synthetic applications of Grignard reagent - preparation and uses of tetra ethyl lead (TEL) **(9 Hours)**

UNIT IV

a) CHROMATOGRAPHY:

Definition - classification - techniques and applications of column chromatography, paper chromatography and Thin Layer Chromatography (TLC) - demonstration: separation of a mixture containing polar and non-polar compounds into its components - applications of chromatography - High Performance Liquid Chromatography (HPLC): principle and instrumentation

b) THERMAL ANALYSIS:

Thermo Gravimetric Analysis (TGA) - introduction - thermogravimetric curve of $CuSO_4.5H_2O$ - applications of thermogravimetry - Differential Thermal Analysis (DTA) - Differential Scanning Calorimetry (DSC) - introduction - instrumentation - applications **(9 Hours)**

UNIT V

CHEMICAL KINETICS:

Rate of a chemical reaction - rate law- rate constant - order of a reaction - molecularity of a reaction - difference between order and molecularity - derivation of the first order rate constant (k) - characteristics of first order reactions - kinetics of ester hydrolysis - half-life period - enzyme kinetics (elementary idea) - characteristics of enzyme catalyzed reactions **(9 Hours)**

COURSE BOOK:

Study material prepared by the department of Chemistry: Allied: General Chemistry -I, Reprint, 2020

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M Chawla, Text book of Organic Chemistry, Sultan Chand and Sons, Sultan Chand and Sons Educational Publishers, Reprint, 2014, **Unit IV**
2. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers 32nd edition, 2015, **Unit I and II**
3. P.L. Soni and M. Katyal, Test book of Inorganic Chemistry, Sultan Chand and Sons, Reprint, 2013, **Unit III and V**

ALLIED PRACTICAL I: ORGANIC ANALYSIS

Semester: III **Hours: 2**

Code : 20CH3AP03 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Apply the techniques of micro qualitative analysis to organic substances	PSO - 2	U, An, Ap
CO - 2	Detect the presence of special element, nitrogen	PSO - 3	U, An
CO - 3	Identify the functional groups in organic substance	PSO - 2	U, An
CO - 4	Demonstrate the reactions in organic analysis	PSO - 3	U, An, Ap
CO - 5	Apply skills on systematic microscale analysis	PSO - 5	U, An, Ap

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

Semester: III				**ALLIED PRACTICAL I: ORGANIC ANALYSIS**							**Hours: 2**
Code : 20CH3AP03											**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	3	4	4	4	3	4	4	4	3	3.73
CO - 2	3	3	4	3	3	3	4	4	3	4	3	3.36
CO - 3	4	3	4	4	3	3	3	4	3	4	4	3.55
CO - 4	4	3	4	3	3	3	3	4	3	4	4	3.45
CO - 5	4	3	4	4	3	3	3	4	3	4	3	3.45
Overall Mean Score												**3.51**

Result: The score for this course is **3.51** (High relationship)

Note:

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

Values Scaling:

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

Microscale Analysis of the Organic Compounds containing one functional group:

Primary amine, amides (mono and di), carbonyl compounds(aldehydes and ketones), carbohydrates, esters, carboxylic acids (mono and di) and phenols. The compound is identified as

i) Aliphatic or aromatic

ii) Saturated or unsaturated

iii) Special elements present /absent and

iv) Nature of functional group (Preparation of solid derivative is not required).

BOOK FOR REFERENCE:

Practical manual prepared by the Department of Chemistry, Reprint, 2020

LASER AND FIBRE OPTICS

Semester: III **Hours: 4**

Code : 20PH3DE1A **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 fundamentals of electromagnetic waves.	PSO - 1	U
CO-2	Describe the properties, types and applications of lasers.	PSO - 1, 3	K, Ap
CO-3	Apply the knowledge of holography.	PSO - 1, 3	K, Ap
CO-4	Classify the modes of optical fiber and its applications.	PSO - 2	An
CO-5	Discuss the concept of non-linear optics.	PSO - 1	U

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

Semester: III				**LASER AND FIBRE OPTICS**							**Hours: 4**
Code : 20PH3DE1A											**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	4	3	3	5	4	4	3	2	3.81
CO-2	5	5	4	3	3	2	5	4	5	2	3	3.72
CO-3	5	5	5	3	4	2	5	4	5	3	3	4.00
CO-4	5	5	4	3	4	3	4	5	4	3	2	3.81
CO-5	5	5	4	5	3	2	5	4	3	3	2	3.72
Overall Mean Score												**3.81**

Result: The score for this course is **3.81** (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: PROPAGATION OF LIGHT WAVES

Maxwell's equations - Physical Significance of Maxwell's equations - Electromagnetic waves - Constitutive relations - Wave equation for free-space - Velocity of the electromagnetic wave - Relation between the refractive index and relative permittivity of a medium - Energy density, the pointing vector and intensity. **(12 Hours)**

UNIT II: LASERS

Attenuation of light in an optical medium - Thermal equilibrium - Interaction of light with matter - Einstein coefficients and their relations - Light amplification- Meeting the three requirements- Components of laser- Lasing action - Principal pumping schemes- Role of resonant cavity -Modes of the laser beam- Transverse modes - Types of lasers- Semiconductor laser - Laser beam characteristics - Applications. **(12 Hours)**

UNIT III: HOLOGRAPHY

Principle of Holography- Coaxial holography - Off-axis holography - Theory - Holograms - Important properties of hologram - Classification of holograms - Applications - Medical applications of holography. **(12 Hours)**

UNIT IV: FIBRE OPTICS

Optical fibre- Total internal reflection - Propagation of light through an optical fibre- Fractional refractive index change - Numerical aperture - Skip distance and number of total internal reflections - Modes of propagation - Types of rays - Classification of optical fibres - The three types of fibres : Single mode step index fibre, Multimode step index fibre, Graded index (GRIN) fibre- Materials: All glass fibres, All plastic fibres, PCS fibres - Losses in optical fibre: Attenuation - Applications - Fibre optic communication system - Merits of optical fibres - Fibre optic sensors. **(12 Hours)**

UNIT V: NON-LINEAR OPTICS

Wave propagation and momentum conservation - Linear medium - Nonlinear Polarization - Second Harmonic Generation - Phase Matching - Sum and Difference Generation - Parmetric oscillation - Self-Focussing of light - Stimulated Raman Scattering. **(12 Hours)**

BOOK FOR STUDY:

- Dr. N. Subramaniyam, Brij Lal and Dr. M. N. Avadhanulu - A Text Book of Optics - S. Chand & Company Pvt. Ltd. - Reprint 2015.

DETAILED REFERENCE:

- Dr. N. Subramaniyam, Brij Lal and Dr. M. N. Avadhanulu - A Text Book of Optics - S. Chand & Company Pvt. Ltd. - Reprint 2015.

  UNIT I : Chapter 13: 13.1, 13 .2, 13 .2.1, 3 .2.2, 13 .3, 13.4, 13.4.1, 13.4.2, 13.7

  UNIT II : Chapter 22: All sections

  UNIT III : Chapter 23: All sections

  UNIT IV : Chapter 24: 24.1-24.12.3, 24.15, 24.15.1, 24.20-24.23.4

  UNIT V : Chapter 25: All .sections

BOOKS FOR REFERENCE:

1. Dr. N. Subramaniyam, Brij Lal and Dr. M. N. Avadhanulu - A Text Book of Optics - S. Chand & Company Pvt. Ltd. - Reprint 2013.
2. A.B.Gupta-Modern optics - Publisher: Arunabha Sen, Books and Allied (P) Ltd, 8/1 Chintamoni Das Lane, Kolkata 700009 - Fifth edition 2015.
3. Devaraj Singh - Fundamentals of optics-©2010 by PHI Learning Limited, New Delhi.

GEOMETRICAL OPTICS

Semester: III **Hours: 4**

Code : 20PH3DE1B **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Discuss the formation of images and related defects by lenses	PSO - 1, 2	U, An
CO-2	Explain the dispersion, refraction, angular dispersion and dispersive power of light.	PSO - 1	K, U
CO-3	Identify the departures of real images from the ideal image with respect to size, shape and position.	PSO - 1, 2	U, An
CO-4	Classify and explain various types of eye pieces.	PSO - 2, 3	An, Ap
CO-5	Describe different types of optical instruments.	PSO - 1, 2	U, An

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

Semester: III				**GEOMETRICAL OPTICS**							**Hours: 4**
Code : 20PH3DE1B											**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	3	3	2	2	5	4	3	3	2	3.18
CO-2	3	4	3	3	3	2	5	4	3	3	2	3.18
CO-3	4	5	4	3	3	2	4	5	3	3	2	3.45
CO-4	4	4	5	3	3	2	3	4	4	3	2	3.36
CO-5	4	5	3	3	3	2	4	4	3	3	2	3.27
Overall Mean Score												**3.31**

Result: The score for this course is **3.31** (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: OPTICAL SYSTEM AND CARDINAL POINTS

Introduction-Cardinal Points- Construction of the Image using cardinal points-Newton's Formula- Relationship between f_1 and f_2 and μ_1 and μ_2- Gaussian Formula- The Three Magnifications and their Inter Relationships- Nodal Slide-Cardinal Points of a Coaxial System of Two Thin Lenses. **(12 Hours)**

UNIT II: DISPERSION

Dispersion by a prism-Refraction through a Prism-Angular Dispersions-Achromatic Combination of Prisms- Deviation without Dispersion- Dispersion without Deviation- Direct Vision Spectroscope. **(12 Hours)**

UNIT III: LENS ABERRATIONS

Introduction-Aberrations-First Order Theory-Third Order Theory-Spherical Aberration-Coma- Astigmatism- Curvature of the field-Distortion-Chromic Aberration-Chromic Aberration in a Lenses- Circle of Least Chromatic Aberration- Achromatic Lenses-Oil- immersion Objective of High Power Microscope- Achromatism of Telescope Objective- Achromatism of Camera Lens-Corrector Plates-Conclusion- Gradient-Index Lenses. **(12 Hours)**

UNIT IV: OPTICAL EYEPIECES

Introduction-The Eye-Camera- Size of an object-The simple Magnifier -Field of View-Stops and Pupils- Objective and Eyepiece-Kellner's Eyepiece-Huygens Eyepiece-Ramsden Eyepiece- Comparison of Ramsden Eyepiece with Huygens Eyepiece-Gauss Eyepiece. **(12 Hours)**

UNIT V: OPTICAL INSTRUMENTS

Compound Microscope-Telescope- Reflection Telescope-Constant Deviation Spectrometer- Pulfrich Refractometer-Abbe Refractometer- Prism Binoculars.

(12 Hours)

BOOK FOR STUDY:

- Dr. N. Subramanyam, Brijlal, Dr.M.N.Avadhanulu - A Text Book of Optics S.Chand & Company Pvt.Ltd- Reprint 2016

DETAIELD REFERENCE:

- Dr. N. Subramanyam, Brijlal, Dr.M.N.Avadhanulu - A Text Book of Optics S.Chand & Company Pvt.Ltd- Reprint 2016

  UNIT I : Chapter 5: 5.1 to 5.10

  UNIT II : Chapter 8: 8.1 to 8.8

  UNIT III : Chapter 9: 9.1 to 9.19

  UNIT IV : Chapter 10: 10.1-10.13

  UNIT V : Chapter 10: 10.14-10.20

BOOKS FOR REFERENCE:

1. M. Born and E. Wolf - Principles of optics: electromagnetic theory of propagation, interference and diffraction of light. Elsevier, 2013
2. Greivenkamp, E. John - Field Guide to Geometrical Optics, SPIE Field Guides SPIE 2004.

FIBRE OPTICS AND COMMUNICATION SYSTEMS

Semester: III **Hours: 4**

Code : 20PH3DE1C **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 fundamentals of electromagnetic waves.	PSO - 1	U
CO - 2	Describe the properties, types and applications of lasers.	PSO - 1, PSO - 3	K, Ap
CO - 3	Apply the knowledge of holography.	PSO - 1, PSO - 3	K, Ap
CO - 4	Classify the modes of optical fiber and its applications.	PSO - 2	An
CO - 5	Understand the concept of communication systems with Fibre optic principles	PSO - 1	U

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

Semester: III			FIBRE OPTICS AND COMMUNICATION SYSTEMS						Hours: 4			
Code : 20PH3DE1C												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	3	3	2	2	5	4	3	3	2	3.18
CO - 2	3	4	3	3	3	2	5	4	3	3	2	3.18
CO - 3	4	5	4	3	3	2	4	5	3	3	2	3.45
CO - 4	4	4	5	3	3	2	3	4	4	3	2	3.36
CO - 5	4	5	3	3	3	2	4	4	3	3	2	3.27
Overall Mean Score												3.31

Result: The score for this course is **3.31** (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: PROPAGATION OF LIGHT WAVES

Maxwell's equations - Physical Significance of Maxwell's equations - Electromagnetic waves - Constitutive relations - Wave equation for free - space - Velocity of the electromagnetic wave - Relation between the refractive index and relative permittivity of a medium - Energy density, The Poyinting vector and Intensity. **(12 Hours)**

UNIT II: LASERS

Attenuation of light in an optical medium - Thermal equilibrium - Interaction of light with matter - Einstein coefficients and their relations - Light amplification- Meeting the three requirements- Components of laser- Lasing action - Principal pumping schemes- Role of resonant cavity - Modes of the laser beam- Transverse modes - Types of lasers - Semiconductor laser - Laser beam characteristics - Applications. **(12 Hours)**

UNIT III: HOLOGRAPHY

Principle of Holography - Coaxial holography - Off-axis holography - Theory - Holograms - Important properties of hologram - Classification of holograms - Applications - Medical applications of holography. **(12 Hours)**

UNIT IV: FIBRE OPTICS

Optical fibre- Total internal reflection - Propagation of light through an optical fibre- Fractional refractive index change - Numerical aperture - Skip distance and number of total internal reflections - Modes of propagation - Types of rays - Classification of optical fibres - The three types of fibres: Single mode step index fibre, Multimode step index fibre, Graded index (GRIN) fibre- Materials: All glass fibres, All plastic fibres, PCS fibres **(12 Hours)**

UNIT V: FIBRE OPTIC COMMUNICATION SYSTEM

Losses in optical fibre: Attenuation - Different mechanisms of attenuation- Distortion - Bandwidth - Characteristics of the fibres-Splicing-Applications - Fibre optic communication system - Merits of optical fibres. **(12 Hours)**

BOOK FOR STUDY:

- Dr. N. Subramaniyam, Brij Lal and Dr. M. N. Avadhanulu - A Text Book of Optics - S. Chand & Company Pvt. Ltd. - Reprint 2015.

DETAILED REFERENCE:

- Dr. N. Subramaniyam, Brij Lal and Dr. M. N. Avadhanulu - A Text Book of Optics - S. Chand & Company Pvt. Ltd. - Reprint 2015.

  UNIT I : Chapter 13: 13.1, 13 .2, 13 .2.1, 3 .2.2, 13 .3, 13.4, 13.4.1, 13.4.2, 13.7

  UNIT II : Chapter 22: All sections

  UNIT III : Chapter 23: All sections

  UNIT IV : Chapter 24: 24.1-24.12.3

  UNIT V : Chapter 24.15-24.22

BOOKS FOR REFERENCE:

1. Dr. N. Subramaniyam, Brij Lal and Dr. M. N. Avadhanulu - A Text Book of Optics - S. Chand & Company Pvt. Ltd. - Reprint 2013.
2. A.B. Gupta-Modern optics - Publisher: Arunabha Sen, Books and Allied (P) Ltd, 8/1 Chintamoni Das Lane, Kolkata 700009 - Fifth edition 2015.
3. Devaraj Singh - Fundamentals of optics-©2010 by PHI Learning Limited, New Delhi.

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.

ELECTROMAGNETISM

Semester: IV **Hours: 6**

Code : 20PH4MC04 **Credits: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Describe the magnetic effects of electric currents.	PSO - 1	K
CO-2	Relate self induction and mutual induction and determine them.	PSO - 1, 2	U, An
CO-3	Explain the mutual induction and determine them.	PSO - 3, 4	An, Ap
CO-4	Discuss various a.c circuits and their applications.	PSO - 3, 4	Ap, C
CO-5	Classify the magnetic properties of materials and related theories.	PSO - 1, 3	U, Ap

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

Semester: IV				**ELECTROMAGNETISM**							**Hours: 6**
Code : 20PH4MC04											**Credits: 6**
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	2	5	4	4	3	3	3.54
CO-2	5	4	4	3	3	2	4	5	5	2	2	3.54
CO-3	5	5	4	2	4	2	4	4	5	5	3	3.90
CO-4	5	4	4	3	3	2	5	5	4	4	3	3.81
CO-5	5	5	4	3	3	2	4	5	4	3	3	3.72
Overall Mean Score												**3.702**

Result: The score for this course is **3.702** (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: MAGNETIC EFFECT OF ELECTRIC CURRENT

Biot-Savart Law - Magnetic induction at a point due to a straight conductor and circular coil - Force on a current carrying conductor in a magnetic field and two parallel current carrying conductors - Force experienced by an electron moving in a magnetic field - Torque on a current loop in a uniform magnetic field - moving coil Ballistic Galvanometer - Current & Voltage sensitiveness - Measurement of Charge sensitiveness - Absolute capacity of a condenser - Comparison of two capacitances - Comparison of Emf's of two cells - Ampere's circuital law - Differential form - Divergence of B - Magnetic field inside a long solenoid and a toroid. **(18 Hours)**

UNIT II: ELECTROMAGNETIC INDUCTION

Faraday's laws of electromagnetic induction - Vector form - Self-induction - Self inductance of a long solenoid - Determination of self-inductance by Rayleigh's method - Determination of self-inductance by Anderson's bridge method - Maxwell's bridge - Owen's bridge - De-Sauty's Bridge. **(18 Hours)**

UNIT III: MUTUAL INDUCTION & MAXWELL'S EQUATION

Mutual inductance - Mutual induction between two co-axial solenoids - Experimental determination of mutual inductance - Co-efficient of coupling - Earth inductor - Search-coil method of measuring magnetic field induction - Determination of ballistic constant K using solenoid inductor - To find the constant K of a B.G. using Hibbert's magnetic standard - Ruhmkorff's induction coil - Eddy currents - Displacement current - Maxwell's equation in material media - Plane electromagnetic wave in free space- Velocity of light - Poynting vector - Hertz experiment for production and detection of electromagnetic waves. **(18 Hours)**

UNIT IV: TRANSIENT CURRENTS & ALTERNATING CURRENT

Growth and decay of current in LR circuit - Measurement of high resistance by leakage- Growth and decay of charge in a LCR circuit - EMF induced in a coil rotating in a magnetic field - AC circuit containing resistance inductance and capacitance in series - LCR circuit - Parallel resonant circuit - Power in ac circuit containing resistance, inductance and capacitance - Wattless current - Choke coil - Transformer - Skin effect . **(18 Hours)**

UNIT V: MAGNETIC PROPERTIES OF MATERIALS

Magnetic induction - Magnetization - Relation between the three magnetic vectors B, H and M - Magnetic susceptibility - Magnetic permeability - Properties of Dia, Para, Ferro materials - Anti-ferro magnetism and ferri magnetism - Electron theory of magnetism - Langevin's theory of diamagnetism - Weiss's theory of Ferro magnetism. **(18 Hours)**

BOOK FOR STUDY:

- R. Murugeshan - Electricity and Magnetism - S. Chand Company, NewDelhi - 2013.

DETAILED REFERENCE:

- R. Murugeshan - Electricity and Magnetism - S. Chand Company, NewDelhi - 2013

  UNIT I: Chapter 10: 10.1 - 10.4, 10.7- 10.21

  UNIT II : Chapter 11: 11.1 - 11.6 & Chapter 19: 19.2 - 19.5

  UNIT III : Chapter 11: 11.7 - 11.16 & Chapter 16: 16.1 - 16.6

  UNIT IV : Chapter 12 : 12.1,12.2, 12.4 - 12.6 & Chapter 13: 13.1 - 13.8

  UNIT V : Chapter 15: 15.1 - 15.17

BOOKS FOR REFERENCE:

1. Brijlal and Subramanyam - Electricity and Magnetism - S. Chand & Co. - 2005.
2. Basudev Ghosh - Foundations of Electricity and Magnetism - Books and Allied (P) Ltd., Kolkata - 2012.

MAJOR CORE PRACTICAL - III

Semester: IV **Hours: 3**

Code : 20PH4CP03 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Determine the dimensions of the material using diffraction pattern.	PSO - 3	Ap
CO-2	Determine optical constants through experiments based on properties of light.	PSO - 3	Ap
CO-3	Determine the thermal properties of materials.	PSO - 3	Ap
CO-4	Make circuits to determine the self inductance of the coil.	PSO - 3	Ap

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

Semester: IV				**MAJOR CORE PRACTICAL - III**							**Hours: 3**
Code : 20PH4CP03											**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	5	2	2	2	4	4	5	3	2	3.45
CO-2	5	4	5	2	2	2	4	4	5	3	2	3.45
CO-3	5	4	5	2	2	2	4	4	5	3	2	3.45
CO-4	5	4	5	2	2	2	4	4	5	3	2	3.45
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any Eight)

1. Study the relationship between angle of incidence (i) and angle of deviation (d) - i-d curve - Spectrometer.
2. Study the relationship between angle of incidence (i) and angle of emergence (i') - i-i' curve- Spectrometer.
3. Determination of the radius of curvature of the given convex lens by forming Newton's Rings.
4. Calibration of High range voltmeter using Potentiometer .
5. Determination Mutual Inductance - Ballistic Galvanometer.
6. Determination of thermal conductivity of a bad conductor- Lee's Disc method.
7. Comparison of capacitances- De Sauty's bridge.
8. Determination of the Charge of an electron- Copper Voltammeter.
9. Determination of absolute capacity of a condenser - Ballistic Galvanometer.
10. Conversion of galvanometer into Ammeter.

ALLIED: GENERAL CHEMISTRY- II

Semester: IV **Hours: 3**

Code : 20CH4AC04 **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire knowledge about the role of chemistry in the service of mankind.	PSO - 3	K, U
CO - 2	Recognize the importance of chemistry and its compounds in day to day life.	PSO - 2	K, An
CO - 3	Summarize the aspects of electrochemistry.	PSO - 3	U, An
CO - 4	Apply the principles of photochemistry in various photophysical processes.	PSO - 2	U, Ap
CO - 5	Recognize the various concepts of surface chemistry and catalysis and outline the importance of polymers.	PSO - 2, PSO - 4	U, C

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

Semester: IV				**ALLIED: GENERAL CHEMISTRY - II**							**Hours: 3**
Code : 20CH4AC04											**Credits: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	3	4	3	4	4	
CO - 1	4	4	3	4	3	3	4	3	4	4	3	3.45
CO - 2	4	3	3	4	4	4	3	4	4	4	4	3.63
CO - 3	4	3	4	3	3	3	3	4	3	4	4	3.55
CO - 4	4	4	4	3	3	3	3	4	3	4	4	3.55
CO - 5	4	3	3	3	4	3	3	4	3	4	4	3.45
Overall Mean Score												**3.53**

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

Note:

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

Values Scaling:

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

UNIT I

CHEMISTRY IN THE SERVICE OF MANKIND:

Antibiotics: definition - classification based on specificity of their action and gram staining method

Antipyretics: definition - preparation and uses of aspirin and paracetamol

Analgesics: definition, types and examples

Antiseptics and Disinfectants: definition, uses and examples

Antimalerials: definition, uses and examples

Insecticides and Pesticides: definition - preparation and uses of DDT and BHC

Fertilizers: Definition - nutrients for plants - role of various elements in plant growth - natural and chemical fertilizers - classification of chemical fertilizers - manufacture of urea- mixed fertilizers - organic farming **(9 Hours)**

UNIT II

ELECTROCHEMISTRY:

Arrhenius theory of electrolytes - strong electrolytes - weak electrolytes - pH of the solutions - buffer solutions - applications of buffer solutions - commercial cells - Leclanche cell - lead storage cell - electroplating - principle and method - factors influencing the nature of deposit - applications - corrosion of metals - disadvantages - methods of preventing corrosion: metallic coatings, electroplating and cathodic protection **(9 Hours)**

UNIT III

PHOTOCHEMISTRY:

Definition - difference between photochemical and thermochemical reactions - Jablonski diagram - laws of photochemistry: Beer - Lambert's law, Grotthus Drapper law and Stark - Einstein Law - photophysical processes - fluorescence and its applications - phosphorescence - photosynthesis - chemiluminescence - bioluminescence - quantum yield : definition and factors affecting quantum yield - kinetics of photochemical reactions: kinetics of hydrogen - chlorine reaction

(9 Hours)

UNIT IV

SURFACE CHEMISTRY:

a) ADSORPTION:

Adsorption - Definition - difference between adsorption and absorption - types of adsorption - difference between physisorption and chemisorption - Freundlich adsorption isotherm - applications of adsorption

b) CATALYSIS:

General characteristics of a catalyst - types of catalysis: homogeneous catalysis, acid-base catalysis, enzyme catalysis - heterogeneous catalysis - auto catalysis - catalytic poisoning - promoters - industrial applications of catalysts. **(9 Hours)**

UNIT V

POLYMER CHEMISTRY:

Definition - classification of polymers based on origin, mode of formation, structure and application - difference between addition and condensation polymerization - rubber: natural rubber - vulcanization - synthetic rubbers: preparation and uses of buna rubbers and neoprene - plastics: thermoplastics and thermosetting plastics - distinction and uses - resins: definition, preparation and uses of bakelite - chemical structure and uses of polyethylene, polypropylene, PVC, PET and teflon **(9 Hours)**

COURSE BOOK:

Study material prepared by the department of Chemistry**:** Allied: General Chemistry - II, Reprint, 2020.

BOOKS FOR REFERENCE:

1. P. L. Soni and Mohan Katyal, Text book of Inorganic Chemistry, Sultan Chand and Sons Educational Publishers, Reprint, 2014.
2. B.R. Puri, L.R. Sharma and Madan S. Pathania, Principles of Physical Chemistry, Vishal Publishing Co., 47th edition, 2016.
3. J. Mendham, R.C. Denney, J. D. Barnes and M.J. K. Thomas, Vogel's Text book of Quantitative Chemical Analysis, Pearson Education Ltd., Reprint, 2005.

ALLIED PRACTICAL II: VOLUMETRIC ANALYSIS

Semester: IV **Hours: 2**

Code : 20CH4AP04 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recognize the techniques of titrimetric analyses.	PSO - 3	U, An
CO - 2	Develop the skills to do the volumetric titration in double burette method.	PSO - 2	U, Ap
CO - 3	Estimate the amount of substance present in the solution.	PSO - 3	U, An
CO - 4	Demonstrate the different types of titrations such as acidimetry, alkalimetry and permanganometry.	PSO - 3	U, Ap
CO - 5	Develop problem solving skills.	PSO - 3	U, Ap

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

Semester: IV				**ALLIED PRACTICAL II: VOLUMETRIC ANALYSIS**							**Hours: 2**
Code : 20CH4AP04											**Credits: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	4	3	3	3	3	4	4	4	3	3.45
CO - 2	3	4	3	4	3	4	3	4	4	4	4	3.64
CO - 3	4	4	4	3	3	3	4	4	4	3	3	3.55
CO - 4	4	3	3	3	3	3	3	4	3	3	4	3.27
CO - 5	3	4	4	4	3	3	3	4	4	3	4	3.55
Overall Mean Score												**3.49**

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

Note:

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

Values Scaling:

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

DOUBLE TITRATION BY MICROSCALE METHOD:

Making up of the solution to be estimated - double burette method

I ACIDIMETRY AND ALKALIMETRY

1. Estimation of NaOH
2. Estimation of Na_2CO_3
3. Estimation of HCl
4. Estimation of oxalic acid

II PERMANGANIMETRY

1. Estimation of ferrous sulphate
2. Estimation of ferrous ammonium sulphate
3. Estimation of oxalic acid

BOOK FOR REFERENCE:

Practical manual prepared by the Department of Chemistry, Reprint, 2020

ELECTRICITY

Semester: IV **Hours: 4**

Code : 20PH4DE2A **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 fundamental laws of electro statistics and their applications.	PSO - 1	K, U
CO-2	Analyze the principle and types of capacitors.	PSO - 2, 3	Ap, An
CO-3	Apply the laws of electricity for electrical measurements.	PSO - 3, 4	Ap, C
CO-4	Compare the behavior of current in series and parallel electrical circuits.	PSO - 1	U
CO-5	Construct and compare the working of a.c bridges.	PSO - 2, 3	Ap, An

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

Semester: IV				**ELECTRICITY**							**Hours: 4**
Code : 20PH4DE2A											**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	4	3	2	2	5	4	4	3	3	3.54
CO-2	5	4	5	2	3	2	4	5	5	2	2	3.54
CO-3	5	4	5	3	2	2	4	4	5	5	4	3.90
CO-4	5	5	4	3	2	2	5	4	4	4	2	3.63
CO-5	5	5	4	2	3	2	4	5	5	3	2	3.63
Overall Mean Score												**3.64**

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

Note:

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

Values Scaling:

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

UNIT I: ELECTROSTATICS

Flux of the electric field- Gauss law- Proof - applications of Gauss law - Electric field due to a uniformly charged sphere-Electric field due to an isolated uniformly charged Conducting sphere- at an external point-at a point inside- Electric field due to an infinite line of Charge- Electric field due to a uniform infinite cylindrical charge- Electric field due to an infinite plane sheet of charge-Field due to two parallel sheets of charge- Coulomb's theorem - Mechanical force on the surface of charged conductor-Energy stored per unit volume in a charged conductor-Coulomb's Inverse square law from Gauss law- Potential difference-Electric Potential as line integral of Electric field-Relation between electric field and electric potential- Potential at a point due to a uniformly charged conducting Sphere. **(12 Hours)**

UNIT II: CAPACITORS AND ELECTROMETERS

Principle of a capacitor- capacitance of a 1)Spherical capacitor 2) Cylindrical capacitor- 3) parallel plate capacitor- Effect of Dielectric - Capacitance of a parallel plate capacitor partly filled with a dielectric Slab- Capacitors in Series and parallel- Energy stored in a charged capacitor - Change in energy of a parallel plate capacitor- Loss of energy on sharing of charges between two capacitors- Force of attraction between plates of a charged parallel plate capacitor- Types of capacitors, Guard ring capacitor, Mica capacitor, electrolytic capacitor and variable air capacitor - Kelvin's electrometer- The Quadrant electrometer. **(12 Hours)**

UNIT III: ELECTRICAL MEASUREMENTS

Current & current density-Expression for current density - Equation of continuity-Ohm's law & electrical conductivity- Kirchhoff's Laws - Applications of Kirchhoff's laws to Wheatstone's network- Sensitivity of Wheatstone's Bridge - Carey foster's Bridge- Potentiometer- Principle- Calibration of ammeter, calibration of low range voltmeter and high range voltmeter - Measurement of low resistance: Kelvin double bridge method-Comparison of capacitances of two capacitors-Capacitance of a capacitor (Kelvin -Null method). **(12 Hours)**

UNIT IV: TRANSIENT CURRENT AND ALTERNATING CURRENT

RC Circuit- Measurement of high resistance by the method of leakage-LR circuit-LC circuit- Transient in series LCR circuit- Alternating currents- Complex number method for AC analysis- Impedance, Reactance and Admittance- Alternating Voltage applied across a circuit containing resistance, inductance and capacitance all in series- Sharpness of resonance in series- LCR circuit- Power in AC circuit- Parallel resonance circuit-Comparative study of a series and a parallel resonant circuit- Skin effect **(12 Hours)**

UNIT V: NETWORK THEOREMS, AC BRIDGES AND THERMO - ELECTRICIT Y

Thevenin's theorem-Norton's theorem-Maxwell's bridge- Anderson's Bridge-Owen's bridge-De Sauty's Bridge- Wien's Bridge- Schering bridge - Seebeck effect - Variation of thermo-emf with temperature - Peltier effect - Peltier co-efficient. **(12 Hours)**

BOOKS FOR STUDY:

1. Electricity and Magnetism by R.Murugesan, S.Chand company Private Limited, Ram nagar, New Delhi, Reprint 2015.
2. Electricity and magnetism by Sathya Prakash, Pragati Prakashan edition, New market, Meerut, Twenty seventh edition , 2012.

DETAILED REFERENCES:

1. Electricity and Magnetism by R. Murugesan, S. Chand company Private Limited, New Delhi, Reprint 2015.

   UNIT I: Chapter:2: 2.1 to 2.14, Chapter:3: 3.1 to 3.5

   UNIT - II: Chapter:4: 4.1 to 4.13, Chapter 5: 5.1 and 5.2

   UNIT -III: Chapter: 6: 6.1 to 6.6**,** Chapter: 7: 7.1 to 7.5
2. Electricity and magnetism by Sathya Prakash, Pragati Prakashan edition, New market, Meerut, Twenty seventh edition , 2012.

   UNIT IV: Chapter: 9: 9.1 to 9.6, Chapter: 10 10.1 to 10.3, 10.9-10.14.

   UNIT V: Chapter:8: 8.13 and 8.14,; Chapter:16: 16.1 to 16.7; Chapter: 17; 1.1 to 17.6.

BOOK FOR REFERENCE

1. Electricity and Magnetism by Brijlal, Subramaniam, S. Chand & Co
2. Electricity and Magnetism by Dr. K.K. Tewari, S. Chand & Co.

NON- CONVENTIONAL ENERGY SOURCES

Semester: IV **Hours: 4**

Code : 20PH4DE2B **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain solar radiation and its measurements.	PSO - 1, 2	K, U
CO-2	Discuss various collection mechanism of solar energy collectors	PSO - 1, 2	U, An
CO-3	Illustrate the various applications of solar energy	PSO - 2, 3	U, Ap
CO-4	Define the principle of wind energy conversion and explain its basic components.	PSO - 1, 2	K, U
CO-5	Analyze the biomass conversion technologies.	PSO - 3, 4	An

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

Semester: IV				**NON- CONVENTIONAL ENERGY SOURCES**							**Hours: 4**
Code : 20PH4DE2B											**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	3	2	2	5	4	3	3	2	3.27
CO-2	4	5	3	3	2	2	4	2	5	3	2	3.26
CO-3	5	4	3	3	2	2	4	5	3	3	2	3.27
CO-4	5	3	4	3	2	2	5	4	3	3	2	3.27
CO-5	4	4	4	3	2	2	4	4	5	3	2	3.36
Overall Mean Score												**3.30**

Result: The score for this course is **3.30** (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: SOLAR RADIATION AND ITS MEASUREMENT

Solar Constant-Solar Radiation at earth surface, Solar Radiation Geometry-Measurements and Data. Estimation of Average Solar Radiation and Solar radiation on titled Surface. **(12 Hours)**

UNIT II: SOLAR ENERGY COLLECTOR

Physics principle of conservation of solar radiation into heat-Flat - Plate Collector (FPC) - Performance analysis of FPC- Concentrating Collector-advantages and disadvantages CC over FPC. **(12 Hours)**

UNIT III: APPLICATION OF SOLAR ENERGY

Solar water heating-Space heating-Space Cooling-Solar electric power generation-Photovoltaics-agricultural and industrial process heat-Solar distillation - Solar pumping - Solar furnace-Solar Cooking. **(12 Hours)**

UNIT IV: WIND ENERGY

Basic principle of wind energy conversion: Nature of Wind- the power in the wind - Forces on the blades and thrust on turbines - Wind Energy Conversion (WFC) - basic components of wind energy conversion. **(12 Hours)**

UNIT V: BIO MASS

Introduction-biomass conversion technologies-photosynthesis-biogas generation-factors affecting biodigestion on generation of gas- classification of bio gas plants-advantages and disadvantages floating drum plant and fixed dome type plant.

(12 Hours)

BOOK FOR STUDY:

- G.D. Rai- Non Conventional Energy Sources. Khanna Publishers, Reprint-2011.

DETAILED REFERENCE

- G.D. Rai- Non Conventional Energy Sources. Khanna Publishers, Reprint-2011.

UNIT I : Chapter 2: 2.1 to 2.8
UNIT II : Chapter 3: 3.1 to 3.3, 3.6 to 3.8
UNIT III : Chapter 5: 5.1 to 5.4, 5.6 to 5.11
UNIT IV : Chapter 6: 6.1, 6.2: 6.2.1 to 6.2.4, 6.5 to 6.7
UNIT V : Chapter 7: 7.1 to 7.8

BOOKS FOR REFERENCES:

1. S.P. Sukhatme - Solar energy of principles thermal and collection and storage, Tata McGraw Hill publication, 1984.
2. N.K.Bansal, M.Kleemann, and M.Melinn - Renewable energy sources and conversion technology, Tata Mcgrow, Hill Publications, 1982.
3. John F. Kreieder, and F. Kreith - Solar Energy hand book, McGraw Hill, 1982.
4. B.H. Khan - Non Conventional Energy Sources - 3rd edition - McGraw Hill Education.

ATMOSPHERE, WEATHER AND CLIMATE

Semester: IV **Hours: 4**

Code : 20PH4DE2C **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 basics of climatology and tropical weather.	PSO - 1	K, U
CO - 2	Discuss the composition, Mass and the layering of the atmosphere.	PSO - 1, PSO - 2	U, An
CO - 3	Explain the Tropical weather of south Asia region.	PSO - 1, PSO - 2	U, An
CO - 4	Illustrate climate variation in Tropics and predict weather forecasting.	PSO - 2, PSO - 3	An, Ap
CO - 5	Describe the climate change over thousand years and the projection of temperature changes through 21st Century.	PSO - 2, PSO - 3	An, Ap

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

Semester: IV			**ATMOSPHERE, WEATHER AND CLIMATE**								**Hours: 4**
Code : 20PH4DE2C											**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	3	2	2	5	4	3	3	2	3.27
CO - 2	4	5	3	3	2	2	4	2	5	3	2	3.26
CO - 3	5	4	3	3	2	2	4	5	3	3	2	3.27
CO - 4	5	3	4	3	2	2	5	4	3	3	2	3.27
CO - 5	4	4	4	3	2	2	4	4	5	3	2	3.36
Overall Mean Score												**3.30**

Result: The score for this course is **3.30** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: INTRODUCTION

The atmosphere - solar energy - Global circulation- climatology - Mid Latitude disturbances - The polar regions - Tropical Weather - Paleo climate - The global climate system. **(12 Hours)**

UNIT II: ATMOSPHERE

Composition of Atmosphere: Primary Gases - Green house gases - Reactive gas species - Aerogels - Variation with height - Variation with latitude and Season - Variation with time. Mass of the Atmosphere: Total Pressure - Vapor pressure. The Layering of Atmosphere: troposphere - Stratosphere - Mesosphere - Thermosphere - Exosphere - and Magnetosphere **(12 Hours)**

UNIT III: TROPICAL WEATHER AND CLIMATE

The inter tropical convergence - Tropical disturbances - water disturbances - Cyclones - Tropical Cloud Clusters - The South Asian Monsoon - Winter - Spring - Early Summer - Summer - Autumn. **(12 Hours)**

UNIT IV: CLIMATE VARIATION IN TROPICS AND WEATHER FORECASTING

El-Nino southern Oscillation (ENSO) events - The pacific oceans - Tele connections - Other sources of climate variations in the tropics- Cool Ocean Current - Topographic effects - Diurnal Variation - Forecasting tropical weather - short and external range forecast - Long range forecast. **(12 Hours)**

UNIT IV: CLIMATE CHANGE

Climate forcing - Climate feed back- Climate response- The importance of framework- The geological record - The last glacial cycle and past glacial conditions- The past 1000 years- understanding recent climate change- Circulation Change- Solar Variability- Volcanic Activity- Anthropogenic factors- Projection of temperature change through the 21st century- Applications of general circulation Models- IPCC simulation. **(12 Hours)**

BOOK FOR STUDY

- Roger G. Barry, Richard J. Chorley- Atmosphere,weather and Climate, Nineth Edition, 2010, Routledge, Newyork .

DETAILED REFERENCE:

- Roger G. Barry, Richard J. Chorley- Atmosphere,weather and Climate, Nineth Edition, 2010, Routledge, Newyork .

UNIT I: Chapter 1: A to I

UNIT II: Chapter 2: A to C

UNIT III: Chapter 11: A to C

UNIT IV: Chapter 11: G to I

UNIT V: Chapter 13: B to E

BOOKS FOR REFERENCE:

1. Roger G. Barry, Elleen A. Hall - . Essential of Earth's Climate System McKim, Cambridge University Press, 2014.
2. Grogery J. Hakim, Jrme patoux- Weather A Concise Introduction, Cambridge University Press, 2017

ATOMIC AND NUCLEAR PHYSICS

Semester: V **Hours: 6**

Code : 20PH5MC05 **Credits: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain different atom models, its merits, demerits and splitting of spectral lines.	PSO - 1	U, K
CO-2	Apply the principle of X-ray diffraction to study the crystal structure.	PSO - 2, 3	An, Ap
CO-3	Discuss the nature of Nuclear forces and nuclear models.	PSO - 1, 2	U, An
CO-4	Discuss radioactivity and its applications in various fields	PSO - 1, 2	U, An
CO-5	Distinguish between nuclear fission, fusion and classify elementary particles.	PSO - 1, 2	K, An

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

Semester: V				**ATOMIC AND NUCLEAR PHYSICS**							**Hours: 6**
Code : 20PH5MC05											**Credits: 6**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	5	4	2	2	2	5	4	3	2	2	3.18
CO-2	4	5	4	2	2	2	4	5	5	3	2	3.64
CO-3	4	5	4	2	2	2	5	5	4	2	2	3.36
CO-4	5	4	4	2	2	2	5	5	3	2	2	3.27
CO-5	5	2	3	2	2	2	5	5	4	3	2	3.18
Overall Mean Score												**3.33**

Result: The score for this course is **3.33** (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: ATOMIC PHYSICS

Atom model and drawbacks - Bohr Atom Model - Critical potentials Frank and Hertz's Method - Davis and Goucher's method - Sommerfeld's Relativistic atom model - Fine Structure of Hα Line - Vector atom model - Quantum Numbers - Coupling Schemes - Pauli's Exclusion Principle - periodic Classification of Elements - Magnetic dipole moment due to orbital motion of the electron - Magnetic dipole moment due to spin - Stern and Gerlach experiment - Optical spectra - Spectral terms and notation - Selection rules - Fine Structure of Sodium D Line - Zeeman effect-Larmor's theorem - Quantum mechanical explanation of the normal Zeeman effect - Anomalous Zeeman Effect - Paschen Back effect - Stark Effect. **(18 Hours)**

UNIT II: X- RAYS

Production of X-Rays - Spacing between three dimensional Lattice Planes - Bragg's law - Bragg X-ray spectrometer - X-ray spectra - Characteristic X-ray spectrum - Moseley's law - Compton effect - X-ray crystallography - Crystal lattice and crystal structure - Bravais lattices - Miller indices - Classification of crystals - Structure of Diamond - Zinc blende - NaCl crystals. **(18 Hours)**

UNIT III: NUCLEAR PHYSICS

Classification of Nuclei - General properties of Nucleus - Binding energy - Packing fraction - Nuclear Stability - Theories of Nuclear Composition - Nuclear forces - Meson theory of nuclear force - Yukawa potential - Discovery of π meson - Models of Nuclear Structure - Liquid drop model - Semi empirical mass formula - Shell model - Evidences - Collective model.

NUCLEAR FISSION AND FUSION

Nuclear Fission - Energy Released in Fission - Explanation on the basis of Liquid drop model - chain reaction - atom bomb - nuclear reactor - nuclear fusion - source of stellar energy - carbon nitrogen cycle - proton cycle - thermo nuclear reactions - hydrogen bomb**.** **(18 Hours)**

UNIT IV: RADIO ACTIVITY

Natural Radio activity - α,β,Ý rays- Properties , α-rays - Range - Experimental determination -Geiger-Nuttal experiment - Geiger's law - Geiger Nuttal law - α-particle disintegration - Theory of α-decay. B - rays - β-ray spectra - Magnetic spectrograph - Origin of the line and continuous spectrum - Neutrino theory of β-decay - K-electron capture. Ý- rays - Determination of the wavelength by Dumond curved crystal spectrometer - Origin of Ý rays - Nuclear isomerism - Internal Conversion - Mossbauer effect - Fundamentals of Laws of radioactivity - Laws of radioactive disintegration - Half-life period - Laws of Successive disintegration - Radioactive dating. **(18 Hours)**

UNIT V: ARTIFICIAL TRANSMUTATION OF ELEMENTS

Bohr's theory of Nuclear disintegration - Q value equation - Threshold energy- Nuclear reaction - Conservation laws - Energy balance - Nuclear transmutation by α Particles, protons, deutrons, neutrons and electrons - Scattering cross section- artificial radio activity - applications of radio isotope.

ELEMENTARY PARTICLES

Classification - Particles and antiparticles - anti matter - fundamental interaction - elementary particle quantum numbers - conservation laws and Symmetry-quark Model. **(18 Hours)**

BOOK FOR STUDY:

- R. Murugeshan and Kiruthiga Sivaprasath - Modern Physics, 17th Edition - S. Chand & Co New Delhi-2013.

DETAILED REFERENCE:

- R. Murugeshan and Kiruthiga Sivaprasath - Modern Physics, 17th Edition - S. Chand & Co New Delhi-2013.

UNIT I	: Chapter 6:6.1, 6.2, 6.4, 6.8-6.28.
UNIT II	: Chapter 7:7.1-7.3, 7.6, 7.7, 7.11-7.15,7.17-7.19.
UNIT III	: Chapter 27:27.1-27.12 & Chapter 35:35.1-35.10
UNIT IV	: Chapter 31:31.1-31.35
UNIT V	: Chapter 34:34.1-34.11.,Chapter 38: 38.1-38.7

BOOKS FOR REFERENCE

1. Charles Kittel - Solid State Physics, 8th Edition - Wiley India Pvt. Limited-1996.
2. S. O. Pillai - Solid State Physics, 7th Edition - New age international publishers - 2015.
3. Irving Kaplan - Nuclear Physics, 2nd Edition - Narosa Publishing House - 2002.
4. K.I. Chopra, N.K.Seghal and D.I. Seghal - Modern Physics - Sultan Chand & Sons - 2013.
5. D.C. Taya l- Nuclear Physics, 4th Revised Edition-Himalaya Publishing House - 2013.
6. Sathya Prakash - Nuclear Physics - Pragati Prakashan (Publisher) - 2011.

MATHEMATICAL PHYSICS

Semester: V **Hours: 5**

Code : 20PH5MC06 **Credits: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Revise the concepts of vector analysis and matrices.	PSO - 1	K, U
CO-2	Compute various parameters of matrices.	PSO - 1, 2, 4	U, An
CO-3	Find the root of infinite series and investigate their convergence.	PSO - 1, 2	K, An
CO-4	Solve complex analysis problems using the relevant theorems.	PSO - 2, 3	An, Ap
CO-5	Apply the knowledge of Fourier series to physical applications	PSO - 2, 3	An, Ap

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

Semester: V				**MATHEMATICAL PHYSICS**							**Hours: 5**
Code : 20PH5MC06											**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	4	4	2	2	2	5	4	3	3	2	3.27
CO-2	5	5	3	2	2	2	5	5	4	5	3	3.81
CO-3	5	5	4	5	3	2	5	5	3	4	3	4.00
CO-4	5	5	4	2	3	2	5	5	3	5	3	3.81
CO-5	5	5	4	2	3	2	5	5	4	5	3	3.90
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: VECTORS

Gradient - Line, Surface and Volume Integrals - Divergence - Curl - Gauss divergence theorem - Stoke's theorem - Green's theorem - Helmholtz theorem - applications - Heat flow & Gravitation. **(15 Hours)**

UNIT II: MATRICES

Types - Transpose - Conjugate - Symmetric and antisymmetric - Hermitian and Skew Hermitian - Determinant - Cofactors - Minors - Singular and nonsingular - Adjoint - Inverse - Orthogonal - Unitary - Trace - Rank - Eigenvalues - Eigenvectors - Cayley-Hamilton theorem. **(15 Hours)**

UNIT III: INFINITE SERIES

Sequence, Series, Finite and Infinite Series - Classification - Geometric, Harmonic- Properties - Convergence Tests - Comparison test, Cauchy (or D'Alembert's) Ratio test, Cauchy's root test, Cauchy's (or Maclaurin) Integral Test - Alternating Series - Absolute convergence - Uniform convergence. **(15 Hours)**

UNIT IV: COMPLEX VARIABLES

Complex conjugates - Modulus and argument - Functions of a complex variable - limit, continuity, differentiability - Analytic function - Necessary and sufficient conditions - Cauchy-Riemann differential equations - Cauchy's integral theorem - Cauchy's integral formula - Derivatives - Liouville's theorem - Taylor's series**.**

(15 Hours)

UNIT V: FOURIER SERIES

Fourier Series - Even and odd functions - Dirichlet's theorem and conditions - Half range series - Change of interval from $(-\pi, \pi)$ to $(-l, l)$ - Complex form - Fourier series in the interval $(0, T)$ - Change of interval from $(0, T)$ to $(0, 2l)$ - Uses - Physical examples: half wave rectifier and full wave rectifier. **(15 Hours)**

BOOK FOR STUDY:

- Satya Prakash - Mathematical Physics (with Classical mechanics) - Sultan Chand & Sons, New Delhi - Sixth Revised Edition 2012.

DETAILED REFERENCE:

- Satya Prakash - Mathematical Physics (with Classical mechanics) - Sultan Chand & Sons, New Delhi - Sixth Revised Edition 2012.

  UNIT I : Chapter 1: 1.2 - 1.14, 1.19 (b & c)

  UNIT II : Chapter 2: 2.1 - 2.23, 2.31, 2.32

  UNIT III : Chapter 5: All sections

  UNIT IV : Chapter 6 : 6.1- 6.5, 6.7 - 6.10, 6.14, 6.16 - 6.17, 6.19 - 6.20

  UNIT V : Chapter8 : 8.1 - 8.9 (1 & 2).

BOOKS FOR REFERENCE:

1. G. B. Arfken and H. J. Weber - Mathematical methods for Physicists, VI Edition - Academic Press, USA - 2005.
2. Erwin Kreyszig - Advanced Engineering Mathematics, VIII Edition - John Wiley & Sons Inc., New York - 2005.
3. H. K. Dass - Mathematical Physics - S. Chand & Company Ltd, New Delhi - 2001.
4. B. S. Grewal - Higher Engineering Mathematics, 37th Edition - Khanna Publishers, New Delhi - 2003.
5. R. K. Jain and S. R. K. Iyengar - Advanced Engineering Mathematics - Narosa Publishing House, New Delhi - 2002.

BASIC ELECTRONICS AND COMMUNICATIONS

Semester: V **Hours: 5**

Code : 20PH5MC07 **Credits: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Apply basic principles of electronics to analyze the types of diodes.	PSO - 1	K, U
CO-2	Compare the characteristics of transistors in different modes of operations	PSO - 1, 3	K, Ap
CO-3	Build and test analog electronic systems such as amplifiers and oscillators.	PSO - 1, 4	K, C
CO-4	Design and test power electronic systems.	PSO - 3, 4	Ap, C
CO-5	Discuss the types of modulation and demodulation and their applications.	PSO - 1	K, U

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

Semester: V				**BASIC ELECTRONICS AND COMMUNICATIONS**								**Hours: 5**
Code : 20PH5MC07												**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	4	3	2	2	3	5	4	3	3	2	3.18
CO-2	3	4	4	2	2	2	4	5	3	3	2	3.09
CO-3	3	4	5	2	2	2	4	4	5	3	2	3.27
CO-4	3	5	4	2	2	2	3	4	4	5	3	3.36
CO-5	5	4	3	2	2	2	4	3	3	3	2	3.00
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: SEMICONDUCTOR DIODES

Energy band theory of solids - Classification of solids on the basis of band theory - Intrinsic and extrinsic semiconductors - PN junction - Biasing of PN junction - Zener diode - Tunnel diode - Photo diode. **(15 Hours)**

UNIT II: TRANSISTORS

Naming the transistor terminal - Transistor symbols - Transistor connections - Common Base - Common Emitter connections - Characteristics of CE connection - CC Connection - Measurement of leakage current - Comparison of transistor connection - Transistor as an amplifier in CE arrangement - Transistor load line analysis - Operating point-Transistor Biasing - Inherent variations of transistor parameters - Stabilization - Essentials of transistor biasing circuit - Stability factor - Methods of transistor biasing - Base resistor method - Voltage divider bias method - Stability factor for potential divider bias. **(15 Hours)**

UNIT III: AMPLIFIERS

Single stage amplifier - How transistor amplifies? - Graphical demonstration - Practical circuit of transistor amplifier - D.C. and A.C. equivalent circuits - Load line analysis - Voltage gain - A.C. emitter resistance - Input impedance of CE amplifier - Classification of amplifiers - RC coupled transistor amplifier - Power amplifier - Small and large signal amplifiers - Difference between voltage and power amplifiers - Classification of power amplifiers.

OSCILLATORS

Positive feedback amplifier - Oscillator - Explanation of Barkhausen criterion - Different types of transistor oscillator - Colpitt oscillator - Hartley oscillator - Phase Shift oscillators - Crystal oscillator. **(15 Hours)**

UNIT IV: POWER ELECTRONICS

Types of field effect transistor - JFET - Principle and working - Symbol - importance - differences - JFET as an amplifier - Characteristics - Salient features - Important terms - Expression for it - Advantages - Parameters - Relation between parameters - Variation of g_m - MOSFET types - Symbols - Characteristics - SCR - working - important terms - Characteristics - SCR normal operation - as a switch - SCR switching - SCR half wave rectifier - UJT - equivalent circuit - characteristics - Advantages - Applications. **(15 Hours)**

UNIT V: MODULATION AND DEMODULATION

Modulation - Transmission and reception - Types of modulation - Amplitude modulation - Modulation factor - Analysis of A.M. wave - Limitations - Side band frequency in A.M. wave - Transistor A.M. modulator - Power in A.M. wave - Frequency modulation - Comparison of F.M. and A.M. - Demodulation - Essentials in demodulation - A.M. radio receiver - FM receiver - differences. **(15 Hours)**

BOOKS FOR STUDY:

1. Vincent Ambrose and Devaraj - Elements of Solid state Electronics - J. K. L Publications - 1992.
2. V. K. Mehta - Principle of Electronics, 11th edition - S. Chand & Company, New Delhi - 2012.

DETAILED REFERENCE:

1. Vincent Ambrose and Devaraj - Elements of Solid state Electronics - J. K. L Publications - 1992.

   UNIT I : Chapter 3: 3.1-3.5.2

2. V. K. Mehta - Principle of Electronics, 11th edition - S. Chand & Company, New Delhi - 2012.

   UNIT II : Chapter 8: 8.1-8.18, Chapter 9: 9.2-9.8, 9.12, 9.13.

   UNIT III : Chapter 10: 10.1-10.4, 10.7-10.10, 10.15, 10.18,
   Chapter 11: 11.5, Chapter 12: 12.1-12.4, 12.6,
   Chapter 14: 14.5-14.13, 14.20.

   UNIT IV : Chapter 19: 19.1-19.15, 19.27-19.32, Chapter 20: 20.1-20.9.
   Chapter 21: 21.2, 21.3, 21.5, 21.6, 21.11-21.15.

   UNIT V : Chapter 16: 16.2-16.17, 16.21, 16.22.

BOOKS FOR REFERENCE:

1. Albert Paul Malvino - Electronic Principles, Sixth edition - Tata McGraw Hill, New Delhi - 2001.
2. Paul B. Zbar, Albert P. Malvino and Michael A. Miller - Basic Electronics - Tata McGraw Hill Publishing Company, New Delhi - 1997.

MAJOR CORE PRACTICAL - IV

Semester: V **Hours: 3**

Code : 20PH5CP04 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Realize the characteristics of diodes	PSO - 3	Ap
CO-2	Compare the characteristics of the transistor in different modes	PSO - 3	Ap
CO-3	Construct amplifiers, oscillators, filters, clippers, clampers and power supply using diodes and transistors	PSO - 3	Ap

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

Semester: V				**MAJOR CORE PRACTICAL - IV**							**Hours: 3**
Code : 20PH5CP04											**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	5	5	2	2	2	4	4	5	3	2	3.45
CO-2	4	5	5	2	2	2	4	4	5	3	2	3.45
CO-3	4	5	5	2	2	2	4	4	5	3	2	3.45
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (any eight)

1. To study the characteristics of Zener diode.
2. To study the characteristics of Transistor - CE mode.
3. To study the characteristics of Transistor - CB mode.
4. To construct the Bridge Rectifier & LC and π filters.
5. To construct Low pass, High pass and Band pass filters.
6. To determine the oscillation frequency - Hartley Oscillator.
7. To measure the output frequency - Colpitt's Oscillator.
8. To study the characteristics of Single Stage Amplifier - CE mode.
9. To study the characteristics Two Stage Amplifier with and without feedback.
10. To analyze and measure voltage limits - Clipper and Clamper circuits.

MAJOR CORE PRACTICAL - V

Semester: V **Hours: 3**

Code : 20PH5CP05 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Construct logic circuits using discrete components.	PSO - 3	Ap
CO-2	Construct multi vibrators using transistors.	PSO - 3	Ap
CO-3	Study the characteristics of OP Amp and its applications.	PSO - 3	Ap

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

Semester: V				**MAJOR CORE PRACTICAL - V**							**Hours: 3**
Code : 20PH5CP05											**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	5	5	2	2	2	4	4	5	3	2	3.45
CO-2	4	5	5	2	2	2	4	4	5	3	2	3.45
CO-3	4	5	5	2	2	2	4	4	5	3	2	3.45
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any eight)

1. Construction and verification of truth tables for AND, OR, NOT gates using discrete components.
2. Construction and verification of truth tables for AND, OR, NOT gates using IC 74 Series.
3. Construction and verification of truth tables for NAND, NOR using discrete components.
4. Construction of AND, OR, NOT gates using NAND , NOR gates - Universal gates
5. Construction and verification of truth tables of Bi stable multi vibrator- Discrete components.
6. Construction and verification of truth tables of Astable multi vibrator - Discrete components.
7. To study the characteristics of Op - Amp.
8. To study the applications of Op - Amp a s an Adder and Subtractor.
9. Construction of Dual Power Supply using IC's.

MATERIALS SCIENCE

Semester: V **Hours: 4**

Code : 20PH5DE3A **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Describe the properties of dielectric materials	PSO - 1, 4	K, Ap
CO-2	Discuss the types of magnetic materials and their theories	PSO - 1, 3	U, Ap
CO-3	Classify the semiconductors and discuss their conduction mechanism	PSO - 1	U, K
CO-4	Explain Superconductivity and its applications	PSO - 1, 2	U, An
CO-5	List down the new materials for variety of applications.	PSO - 1, 2	K, An

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

Semester: V				**MATERIALS SCIENCE**								**Hours: 4**
Code : 20PH5DE3A												**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	3	3	2	2	3	4	3	4	3	3.27
CO-2	4	5	3	3	2	2	4	4	3	4	3	3.36
CO-3	5	4	4	3	2	2	4	4	5	4	3	3.63
CO-4	4	4	5	3	2	2	3	4	4	3	3	3.36
CO-5	5	4	4	3	2	2	3	3	3	4	5	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: DIELECTRIC MATERIALS

Fundamental definitions - Different types of electric polarization - Frequency and temperature effects - Dielectric loss - Local field - Clausius-Mossotti relation - Determination of dielectric constant - Dielectric breakdown - Properties and different types of insulating materials - Ferroelectric materials. **(12 Hours)**

UNIT II: MAGNETIC MATERIALS

Different types of magnetic materials - Classical theory of diamagnetism - Langevin theory of paramagnetism - Weiss theory of paramagnetism - Weiss theory of ferromagnetism - Heisenberg's theory of ferromagnetism - Domain theory of ferromagnetism - Hard and soft materials. **(12 Hours)**

UNIT III: SEMICONDUCTING MATERIALS

Chemical bonds in semiconductors - Carrier concentration in intrinsic semiconductor - Carrier concentration in n-type and p-type semiconductors - Determination of carrier concentration - Variation of carrier concentration with temperature in n-type semiconductors - Conductivity of extrinsic semiconductor - P-N junction theory - Direct and indirect band gap semiconductors. **(12 Hours)**

UNIT IV: SUPERCONDUCTING MATERIALS

Explanations for the occurrence of superconductivity - General properties of superconductors - General observations - Types of superconductors - High temperature superconductors - Applications. **(12 Hours)**

UNIT V: NEW MATERIALS

Metallic glasses - Fibre reinforced plastics and fibre reinforced metals - Metal matrix composites - Biomaterials - Ceramics - Cermets - High temperature materials - Thermoelectric materials - Shape memory alloys - SMART materials - Conducting polymers. **(12 Hours)**

BOOK FOR STUDY:

- Dr. M. Arumugam - Materials Science, 3rd revised edition - Anuradha Publications - 2009.

DETAILED REFERNCE:

- Dr. M. Arumugam - Materials Science, 3rd revised edition - Anuradha Publications - 2009.

  UNIT I : Chapter 6: All sections

  UNIT II : Chapter 7: All sections

  UNIT III: Chapter 9: All sections

  UNIT IV : Chapter 8: All sections

  UNIT V : Chapter 11: 11.1-11.10, 11.15 -11.17

BOOKS FOR REFERENCE:

1. R. Murugeshan and Kiruthiga Sivaprasath - Modern Physics, 17th revised edition - S. Chand & Co., New Delhi - 2013.
2. Charles Kittel - Solid State Physics, 7th edition - Wiley India Pvt. Limited - 199

BIOPHYSICS

Semester: V **Hours: 4**

Code : 20PH5DE3B **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Identify the structure and components of cells.	PSO - 1	K, U
CO-2	Explain the Physics of bio molecules.	PSO - 1	K, U
CO-3	Discuss the thermodynamics of biomembranes.	PSO - 1	U
CO-4	Describe interdisciplinary aspects of Physics and Biology.	PSO - 1	K
CO-5	Illustrate bioenergetics and neurobiophysics.	PSO - 1, 3	U, Ap

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

Semester: V				**BIOPHYSICS**							**Hours: 4**
Code : 20PH5DE3B											**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	3	2	2	2	5	5	3	2	2	3.18
CO-2	5	4	3	2	2	2	5	4	3	2	2	3.09
CO-3	5	4	3	2	2	2	5	4	3	2	2	3.09
CO-4	5	4	3	2	2	2	5	5	3	3	2	3.27
CO-5	5	4	3	2	2	2	5	5	5	3	2	3.45
Overall Mean Score												**3.21**

Result: The score for this course is **3.21** (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: CELL - ITS ORGANELLES AND MOLECULES

Prokaryotes and Eukaryotes - Molecular components of cell - Carbohydrates - Monosaccharides, Disaccharides, Polysaccharides - Lipids - Lipid monomers, Fatty acids, Multicomponent Lipids, Complex Lipids - Proteins - Nucleic Acids - Heteromacromolecules. **(12 Hours)**

UNIT II: PHYSICS OF BIOMOLECULES

Molecular forces - Strong force - Intermolecular weak forces - Structural organization of Proteins and Nucleic acids - Molecular mechanism of Genetic Information Transfer Genetic code - Transfer of genetic information - Molecular mechanism of Protein synthesis - Principle of molecular recognition. **(12 Hours)**

UNIT III: THERMODYNAMICS OF BIOMEMBRANES

Equilibrium thermodynamics - Near equilibrium thermodynamics - Isolated and Open systems - Gibbs free energy - Chemical potential - Thermodynamic analysis of membrane transport - Simple and Facilitated Diffusion - Phase Equilibrium - More on irreversible thermodynamics. **(12 Hours)**

UNIT IV: BIOENERGETICS

Bioenergetics and ATP molecules - Redox reactions - Electro-chemical Half cells, Redox couples - Cellular respiration - Mitochondria, Energetics, Respiration and Oxidative Phosphorylation - Chemiosmotic theory - Photosynthesis - Muscle contraction. **(12 Hours)**

UNIT V: NEUROBIOPHYSICS

Anatomy of neurons - Physico-chemical nature of membrane potential - Nernst potential, Hodgkin-Katz-Goldman potential, Donnan Potential - Electric analog of membrane - Nerve excitation - Action potential - Conduction of action potential - Synaptic transmission. **(12 Hours)**

BOOK FOR STUDY:

- P. K. Srivastava - Elementary Biophysics - Narosa Publishing House, New Delhi - 2005.

DETAILED REFERENCE:

- P. K. Srivastava - Elementary Biophysics - Narosa Publishing House, New Delhi - 2005.

UNIT I : Chapter 6: 6.1 to 6.7

UNIT II : Chapter 7: 7.1 to 7.10

UNIT III : Chapter 9: 9.1 to 9.7

UNIT IV : Chapter 10: 10.1 to 10.6

UNIT V : Chapter 11: 11.1 to 11.7

BOOKS FOR REFERENCE:

1. Vasantha Pattabhi - Biophysics - Prentice Hall of India Private Limited, New Delhi - 2003.
2. G. R. Chatwal - Biophysics - Himalaya Publishing House, Mumbai - 2011.
3. Vatsala Piramal - Biophysics - Dominant Publishers and Distributors Private Limited, New Delhi - 2014.
4. K. Sarn - Biophysics - Rajat Publications, New Delhi - 2005.
5. Ismael Azad - Biophysics - Arise Publishers & Distributors, New Delhi - 2008.

SOLID STATE PHYSICS

Semester: V **Hours: 4**

Code : 20PH5DE3C **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the nature of interatomic forces.	PSO - 1	K, U
CO - 2	Explain the various types of bondings in solids	PSO - 1	K, U
CO - 3	Analyze the band theories of semiconductors	PSO - 1, PSO - 2	U, An
CO - 4	List out the theories of superconductivity	PSO - 1, PSO - 2	U, An
CO - 5	Classify the types of superconductors and their applications	PSO - 2, PSO - 3	An, Ap

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

Semester: V				**SOLID STATE PHYSICS**							**Hours: 4**
Code : 20PH5DE3C											**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	3	2	2	2	5	5	3	2	2	3.18
CO - 2	5	4	3	2	2	2	5	4	3	2	2	3.09
CO - 3	5	4	3	2	2	2	5	4	3	2	2	3.09
CO - 4	5	4	3	2	2	2	5	5	3	3	2	3.27
CO - 5	5	4	3	2	2	2	5	5	5	3	2	3.45
Overall Mean Score												**3.21**

Result: The score for this course is **3.21** (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: INTERATOMIC FORCES AND BONDINGS IN SOLIDS - I

Forces Between Atoms - Cohesion of Cohesive Energy - Bonding in Solids - Ionic Bonding - Bond Energy of NACL Molecule - Calculation of Lattice Energy of Ionic Crystals - Calculation of Madelung Constants of Ionic Crystals.

(12 Hours)

UNIT II: INTERATOMIC FORCES AND BONDINGS IN SOLIDS - II

Calculation of Repulsive Exponent From Compressibility Data - The Born - Haber Cycle - Properties of Ionic Solids - Examples of Ionic Solids - Covalent Bond - Saturation In Covalent Bonds - Directional Nature of a Covalent Bond - Hybridization - Properties of Covalent Compounds - Metallic Bond - Properties of Metallic Crystals - Intermolecular Bonds - Dispersion Bonds - Dipole Bonds - Hydrogen Bonds. **(12 Hours)**

UNIT III: PHYSICS OF SEMICONDUCTORS

The Band Structure of Semiconductors - Semiconductors - Intrinsic Semiconductors - Conductivity and Temperature - Electrical Conductivity - Impurity Semiconductors or Extrinsic Semiconductors - Hall Effect - Advantages of Semiconductor Devices. **(12 Hours)**

UNIT IV: SUPERCONDUCTIVITY - I

Historical Introduction - A survey of Superconductivity - An account of the Mechanism of Superconductors - Effect of Magnetic Field - A . C. Resistivity - Critical Currents - Flux Exclusion: The Meissner Effect - Thermal Properties - The Energy Gap - Isotope Effect - Mechanical Effects - The Penetration Depth.

(12 Hours)

UNIT V: SUPERCONDUTIVITY - II

Type I and Type II Superconductors - London Equations: Electrodynamics - Superconductors in A.C. Fields - Thermodynamics of Superconductors - A survey of BCS Theory - BCS Theory - Quantum Tunnelling - Josephson's Tunnelling - Theory of D. C. Josephson's Effect - New Superconductors - Applications of Superconductivity in Early Days and their Limitations - Potential Applications of Superconductivity - Power Applications of Superconductors. **(12 Hours)**

COURSE BOOK:

- S. O. Pillai - Solid State Physics 7th Edition 2015.

DETAILED REFERECE:

- S. O. Pillai - Solid State Physics 7th Edition 2015.

  UNIT I : Chapter 3: 3 - 3.9

  UNIT II : Chapter 3: 3.10 - 3.24

  UNIT III : Chapter 10: 10.1 - 10.5, 10.7 - 10.8, 10.14 -10.15

  UNIT IV : Chapter 8: 8.1 - 8.12

  UNIT V : Chapter 8: 8.13 - 8.25

BOOKS FOR REFERENCE:

1. Charles Kittel - Solid State Physics, VII edition - Wiley Eastern Ltd. - 1996.
2. Ajay Kumar Saxena - Solid State Physics - Macmillan India Limited - 2006.

ASTROPHYSICS

Semester: V **Hours: 2**

Code : 20PH5GE01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Discuss the characteristics of Earth and Moon	PSO - 1	K, U
CO-2	Explain various aspects of Solar system, in general and Planets, in particular	PSO - 2, 3	Ap, An
CO-3	Describe the properties and different layers of Sun	PSO - 3, 4	Ap, C
CO-4	Formulate the theories and properties of Stars and Galaxies	PSO - 1, 3	U,Ap
CO-5	Classify the different stages of stars in stellar evolution	PSO - 2, 3	Ap, An

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

Semester: V				**ASTROPHYSICS**							**Hours: 2**
Code : 20PH5GE01											**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	3	2	2	5	4	4	3	3	3.54
CO-2	4	5	5	2	3	2	4	5	5	2	2	3.54
CO-3	4	4	5	5	2	2	4	4	5	5	4	4.00
CO-4	5	5	4	3	2	2	5	4	5	4	2	3.72
CO-5	5	5	4	2	3	2	4	5	5	3	2	3.63
Overall Mean Score												**3.69**

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

Note:

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

Values Scaling:

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

UNIT I: EARTH AND MOON

Earth: Shape - Earth as an oblate spheroid - Mass - Atmosphere - Seasons - Various time measurements. Moon: Distance from earth - Linear diameter - Mass - Eclipses - Lunar, Solar and Total Solar. **(6 Hours)**

UNIT II: SOLAR SYSTEM

Sun - Planets: Classification, Orbits, Configurations, Sidereal and Synodic Periods, Masses, Temperatures and Atmospheres - Satellites - Asteroids - Meteroites - Comets. **(6 Hours)**

UNIT III: SUN

Physical properties - Photosphere - Chromosphere - Corona - Sun Spots - Solar Prominences - Solar flares - Solar Wind - Solar Cycle. **(6 Hours)**

UNIT IV: STARS

Stellar parallax - Distance Units - Starlight measurement - Luminosity and Brightness of a star - Colors of stars - Henry Draper stellar spectra classification - Hertzsprung-Russell diagram. **(6 Hours)**

UNIT V: STELLAR EVOLUTION AND GALAXIES

Birth of stars - Main sequence stars - Origin of red giant stars - Color magnitude diagrams - Neutron stars - Black holes - Galaxies (Summary only). **(6 Hours)**

BOOK FOR STUDY:

- Study material prepared by Dr. Mrs. M. Arulmozhi, Associate Professor of Physics, Jayaraj Annapackiam College for Women (Autonomous), Periyakulam.

BOOKS FOR REFERENCE:

1. K. D. Abhyankar - Astrophysics, Stars & Galaxies - Universities Press Private Limited, India - 2001.
3. William J. Kaufmann III - Universe (Fourth Edition) - W. H. Freeman and Company, New York - 1994.
4. S. Kumaravelu and Suseela Kumaravelu - Astrophysics - Shree Vishnu Arts, Sivakasi - 2004.
5. Nicholas A. Pananides and Thomas Arny - Introductory Astronomy (Second Edition) - Addison-Wesley Publishing Company, USA - 1973.

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.

THEORETICAL PHYSICS

Semester: VI **Hours: 5**

Code : 20PH6MC08 **Credits: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Define the concepts of theory of relativity.	PSO - 1	K, U
CO-2	Relate the principles of classical mechanics to various applications	PSO - 1 , 2, 3	K, An, Ap
CO-3	Describe the properties of wave functions and its applications	PSO - 2, 3	An, Ap
CO-4	Reason out the breakdown of classical mechanics and the evolution of quantum mechanics	PSO - 1, 2	U, An
CO-5	Classify the classical and quantum statistics and compute the distribution functions.	PSO - 1, 2	U, An

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

Semester: VI				**THEORETICAL PHYSICS**							**Hours: 5**
Code : 20PH6MC08											**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	5	4	4	3	5	4	4	4	3	3.27
CO-2	5	5	5	4	4	3	5	5	5	3	4	3.45
CO-3	5	5	5	4	4	3	5	5	5	4	3	3.36
CO-4	5	5	5	4	4	3	5	5	4	3	4	3.36
CO-5	5	5	5	5	5	4	5	5	4	4	3	3.63
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: RELATIVITY

Newtonian Relativity - Michelson-Morley Experiment - Negative result interpretation - Lorentz Transformation - Time Dilation - Twin Paradox - Length Contraction - Relativity of Mass - Mass Energy Equivalence - Velocity Transformation - General Theory of Relativity. **(15 Hours)**

UNIT II: CLASSICAL MECHANICS

Conservative Forces - Degrees of Freedom - Constraints - Generalised Co-ordinates - Principle of virtual work - D' Alembert's Principle - Lagrangian Function - Derivation of Lagrangian Equation of Motion - Applications (Atwood's Machine, Simple Pendulum, Compound Pendulum) - Hamiltonian Function - Hamilton's Canonical Equation of motion and its derivation. **(15 Hours)**

UNIT III: WAVE MECHANICS

Expression for Group Velocity - Experimental study of Matter Waves - Heisenberg's Uncertainty Principle - Wave mechanical atom model - Basic Postulates of Wave Mechanics - Schrodinger Equation - Properties of Wave Function - Applications - Particle in a Box - Linear Harmonic Oscillator. **(15 Hours)**

UNIT IV: QUANTUM MECHANICS

Specific Heat Capacity of Solids - Einstein's Theory - Debye's Theory - Failure of Classical Mechanics - Postulates of Quantum Mechanics - Probability Current Density - Free Particle - Rectangular Potential Well - Ehrenfest's theorem. **(15 Hours)**

UNIT V: STATISTICAL MECHANICS

Macroscopic and Microscopic definitions - Phase Space - Ensembles - Probability Distribution - Boltzmann Theorem on Entropy and Probability - Postulates - Classical and Quantum Statistics - MB Statistics - Molecular Energies in an ideal gas - Black Body Radiation - Rayleigh-Jeans Formula - Planck Radiation Formula - Wien's Law - Stefan-Boltzmann Law - BE Statistics - Fermi Dirac Statistics - Fermi Energy - Comparison of three Statistics - Electron Gas in metals. **(15 Hours)**

BOOKS FOR STUDY:

- R. Murugeshan and Kiruthiga Sivaprasath - Modern Physics, 17th revised edition - S. Chand & Co., New Delhi - 2013.
- R. Murugeshan - Modern Physics, 11th revised edition - S. Chand & Co., New Delhi - 2003.

DETAILED REFERENCE:

- R. Murugeshan and Kiruthiga Sivaprasath - Modern Physics, 17th revised edition - S. Chand & Co., New Delhi - 2013.

  UNIT I : Chapter 1: All sections

  UNIT III: Chapter 11: 11.1-11.5, 11.7-11.10, 11.13

  UNIT IV : Chapter 41: 41.10-41.12, Chapter 12: 12.1-12.4, 12.6

  UNIT V : Chapter 76: 76.1-76.9, Chapter 75: 75.1-75.12

- R. Murugeshan - Modern Physics, 11th revised edition - S. Chand & Co., New Delhi - 2003.

  UNIT II : Chapter 18: 18.1-18.12

BOOKS FOR REFERENCE:

1. Arthur Beiser - Perspectives of Modern Physics - McGraw Hill Book Company - 1968.
2. Herbert Goldstein, Charles P. Poole and John Safko - Classical mechanics, 3rd edition - Dorling Kindersley (India) Pvt. Limited - 2011.

MICROPROCESSOR

Semester: VI **Hours: 5**

Code : 20PH6MC09 **Credits: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain the architecture of Microprocessor and its operations.	PSO-1	K, U
CO-2	List the instructions of 8085 μP with logical operations.	PSO - 3, PSO - 4	AP, C
CO-3	Write programs with arithmetic, logic operations and debugging.	PSO - 1, PSO - 2	K, An
CO-4	Discuss the counting, subrooting techniques with time delays.	PSO - 1, PSO - 2	K, An
CO-5	Analyze the interrupt, interfacing and data conversion mechanisms.	PSO - 2, PSO - 3	An, Ap

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

Semester: VI				**MICROPROCESSOR**							**Hours: 5**
Code : 20PH6MC09											**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	4	3	3	5	4	4	3	4	4
CO-2	5	5	4	3	4	3	4	4	5	5	3	4.09
CO-3	5	5	5	3	3	2	5	5	4	3	2	3.81
CO-4	5	5	4	3	3	2	5	5	3	4	3	3.81
CO-5	5	5	3	3	2	3	4	5	5	3	2	3.63
Overall Mean Score												**3.86**

Result: The score for this course is **3.86** (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: MICROPROCESSOR ARCHITECTURE AND MICROCOMPUTER SYSTEM

Microprocessor architecture and its operations - Microprocessor initiated operations and 8085 bus organizations - Internal data operations and 8085 registers - Peripheral or externally initiated operations - Memory - Flip Flop as a storage element - Memory map and addresses - Memory address range of a 1k memory chip - Memory address lines- Memory word size - Instruction fetch - Memory classification - Examples of a Microcomputer system - Logic devices for interfacing: Tri-state devices - Buffer - Decoder-Encoder - D flip flops : Latch and Clocked. **(15 Hours)**

UNIT II: 8085 ASSEMBLY LANGUAGE PROGRAMMING

8085 programming model - 8085 hardware model - programming model - Instruction classification - 8085 instruction set - Instruction, data format and storage - Instruction word size - Opcode format - data format - Instruction and data storage - Execute a simple program - Adding two hexadecimal numbers - Overview of the 8085 Instruction set.

INTRODUCTION TO 8085 INSTRUCTIONS

Data transfer operations - Addressing modes - Arithmetic operations - Addition - Illustrative program : Addition and increment - Subtraction - Illustrative program : Subtraction of two unsigned numbers - Logic operations - logic AND-Program - Data masking with logic AND - OR, Exclusive OR and NOT-setting and resetting specific bits - Program: ORing Data from two input ports - Branch operations - Unconditional jump and Conditional jump with programs - Writing assembly language programs - Debugging a program. **(15 Hours)**

UNIT III: PROGRAMMING TECHNIQUES WITH ADDITIONAL INSTRUCTIONS

Programming techniques: Looping, counting and indexing - Continuous loop - conditional loop - Additional data transfer and 16 bit arithmetic instructions - Arithmetic operations related to memory - Instructions - program: Addition with carry - Logic operations: Rotate and Compare - Dynamic debugging - Tools for Dynamic debugging - Common sources of Errors. **(15 Hours)**

UNIT IV: COUNTERS AND TIME DELAYS

Counters and time delays - Time delay using one Register, Time delay using a Register pair, Time delay using a loop within a loop technique - Additional techniques for time delay - Counter design with time delay - Hexadecimal counter- Generating pulse waveforms - Debugging counter and time delay programs - Illustrative program for Debugging.

STACK AND SUBROUTINES

Stack - Subroutines - Restart, Conditional Call and Return Instructions - Advanced Sub Routine Concepts - Nesting - Multiple ending subroutines. **(15 Hours)**

UNIT V: INTERFACING PERIPHERALS

INTERRUPTS: 8085 Interrupt - Restart instructions - Multiple interrupts and priorities - Vectored interrupts - TRAP - RST 7.5, 6.5, 5.5 - Restart as software instructions.

INTERFACING DATA CONVERTERS: Digital to Analog converters - Basic concepts - D/A convert circuits - Microprocessor compatible D/A converters - Interfacing a 10 bit D/A converter - Analog to Digital converters - Basic concepts - Successive approximation A/D converter - Interfacing 8 bit A/D converters with illustration. **(15 Hours)**

BOOK FOR STUDY:

- Microprocessor Architecture, Programming and Applications with the 8085, Ramesh S. Gaonkar, Fifth Edition, Penram International publishing (India) Private limited, 2011

DETAILED REFERENCE:

- Microprocessor Architecture, Programming and Applications with the 8085, Ramesh S. Gaonkar, Fifth Edition, Penram International publishing (India) Private limited, 2011

  UNIT I : Chapter 3: 3.1, 3.2, 3.4, 3.5

  UNIT II : Chapter 2: 2.1 - 2.5, Chapter 6: 6.1- 6.6

  UNIT III: Chapter 7: 7.1- 7.6

  UNIT IV : Chapter 8: 8.1- 8.2, 8.4 - 8.5,Chapter 9: 9.1- 9.4

  UNIT V : Chapter 12: 12.1- 12.3,Chapter 13: 13.1, 13.2

BOOKS FOR REFERENCE:

1. Introduction to Microprocessor - II - A. P. Mathur (1988) Edn. TMH, Delhi.
2. Microprocessor and Microcontrollers, Architecture, Programming and System Design 8085, 8086, 8051, 8096. Krishna Kant, PHI Learning private limited, New Delhi.
3. Fundamental of Microprocessor and Microcomputers, B.Ram, Sixth Edition, Dhanpat Rai Publications (P) Ltd.

DIGITAL ELECTRONICS

Semester: VI **Hours: 5**

Code : 20PH6MC10 **Credits: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Construct logic circuits with basic gates.	PSO-1, PSO-3, PSO-4	U, Ap, C
CO-2	Construct data processing circuits.	PSO-1, PSO-3	U, AP
CO-3	Illustrate the operations of flip-flops and registers.	PSO-1, PSO-2	K, An
CO-4	Compare the synchronous and asynchronous counter and their usage in display units.	PSO-2, PSO-3	An, Ap
CO-5	Describe the characteristics and application of Op Amps.	PSO-1, PSO-3	K, An

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

Semester: VI				**DIGITAL ELECTRONICS**							**Hours: 5**
Code : 20PH6MC10											**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	4	5	2	2	2	5	4	5	5	2	3.72
CO-2	5	4	5	2	2	2	5	3	5	4	2	3.55
CO-3	5	4	5	2	2	2	5	5	4	3	2	3.55
CO-4	5	5	4	2	2	2	4	5	5	3	2	3.55
CO-5	5	4	5	2	2	2	5	4	5	4	2	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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I: DIGITAL LOGIC

Basic gates - NOT, OR, AND, Universal logic gates - NOR, NAND, AND-OR Invert gates - Demorgan's theorem - Positive and Negative logic - Boolean laws and theorem - Sum of products method - Product of sums method - Truth table to Karnaugh map - Pairs, Quads and Octets - Karnaugh simplifications - Don't care conditions. **(15 Hours)**

UNIT II: DATA PROCESSING CIRCUITS

Multiplexers, Demultiplexers, 1-of-16 Decoder - BCD to decimal decoders - Seven segment decoder - Encoders - Ex-OR gates - Parity generators - Checkers - Magnitude comparator - ROM and programmable array logic (PAL) - Programmable logic arrays. **(15 Hours)**

UNIT III: FLIP FLOPS AND SHIFT REGISTERS

Flip Flops: RS Flip flop - Edge triggered RS Flip flops - Edge triggered D Flip flops - Edge triggered JK Flip flops - JK Master Slave Flip flops - Schmitt Trigger.

Shift Registers: Types of registers - Serial IN, Serial OUT - Serial IN, Parallel OUT- Parallel IN, Serial OUT - Parallel IN, Parallel OUT, Ring counters. **(15 Hours)**

UNIT IV: COUNTERS

Asynchronous Counters - Decoding gates - Synchronous counters - Changing the counter modulus - Decade counters - Variable resistor networks - Binary ladders - D/A Converters - A/D converter - Simultaneous conversion, counter method.

(15 Hours)

UNIT V: OPERATIONAL AMPLIFIERS

The Ideal Op - Amp - Equivalent Circuit of an Op - Amp - Ideal Voltage Transfer Curve - Open Loop Op - Amp Configurations - Voltage Series Feedback Amplifiers - Voltage shunt Feedback Amplifiers - Virtual ground - Differential Amplifiers. **(15 Hours)**

BOOK FOR STUDY:

- Donald P. Leach, Albert Paul Malvino, Goutam Saha - Digital Principles and Applications, Seventh edition - Tata McGraw Hill Publishing Company Ltd, New Delhi - 2012.
- Ramakant A. Gayakwad - Op - amps and Linear Integrated Circuits - PHI Learning Private Limited, New Delhi - 2009.

DETAILED REFERENCE:

- Donald P. Leach, Albert Paul Malvino, Goutam Saha - Digital Principles and Applications, Seventh edition - Tata McGraw Hill Publishing Company Ltd, New Delhi - 2012.

  UNIT I : Chapter 2: 2.1-2.7, Chapter 3: 3.1-3.7

  UNIT II : Chapter 4: 4.1-4.12

  UNIT III: Chapter 7: 7.3, Chapter 8: 8.1-8.8, Chapter 9: 9.1-9.6

  UNIT IV: Chapter 10: 10.1-10.5, Chapter 12: 12.1-12.3, 12.5, 12.6

- Ramakant A. Gayakwad - Op - amps and Linear Integrated Circuits - PHI Learning Private Limited, New Delhi - 2009.

  UNIT V: Chapter 2: 2.3-2.6, Chapter 3: 3.3-3.5

BOOKS FOR REFERENCE:

1. M. Morris Mano - Digital Logic and Computer design - Prentice Hall of India Pvt. Ltd, New Delhi - 2003.
2. Douglas V. Hall - Digital Circuits and Systems - McGraw Hill Publishing Company - 1989.

PROJECT

Semester: VI **Hours: 2**

Code : 20PH6PR01 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Draw layouts for the electronic circuits.	PSO - 4	Ap
CO-2	Perform chemical etching.	PSO - 4	Ap
CO-3	Solder electronic components on PCB.	PSO - 4	Ap
CO-4	Construct electronic circuits and interpret the output.	PSO - 4	Ap
CO-5	Consolidate and present their work.	PSO - 2, 4	An, Ap

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

Semester: VI				**PROJECT**							**Hours: 2**
Code : 20PH6PR01											**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	3	4	4	4	5	2	3.55
CO-2	4	3	3	2	2	2	3	3	4	5	2	3.00
CO-3	5	4	4	2	2	2	4	3	3	5	2	3.27
CO-4	5	3	5	2	2	3	4	4	3	5	3	3.55
CO-5	5	4	3	2	2	5	3	5	4	5	4	3.82
Overall Mean Score												**3.43**

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

Note:

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

Values Scaling:

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

MAJOR CORE PRACTICAL - VI

Semester: VI **Hours: 3**

Code : 20PH6CP06 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Differentiate analog and digital circuits.	PSO -3	Ap
CO-2	Construct oscillators using transistors and UJT.	PSO-3	Ap
CO-3	Construct logic circuits using IC's.	PSO-3	Ap

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

Semester: VI				**MAJOR CORE PRACTICAL - VI**							**Hours: 3**
Code : 20PH6CP06											**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	5	5	2	2	2	4	4	5	3	2	3.45
CO-2	4	5	5	2	2	2	4	4	5	3	2	3.45
CO-3	4	5	5	2	2	2	4	4	5	3	2	3.45
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any Eight)

1. Construction of regulated power supply using Zener Diode.
2. Construction of Astable multivibrator using IC-555.
3. Verification of De-Morgan's theorem.
4. Construction and verification of truth tables for X-OR & X-NOR gates.
5. To study the characteristics of FET.
6. Construction of relaxation oscillator - UJT.
7. Construction of Phase shift oscillator.
8. Construction and verification of truth tables for - RS, D and JK flip flops
9. Construction and verification of truth tables for Half adder and Half subtractor.
10. Construction of Half wave and Full wave rectifier.

MAJOR CORE PRACTICAL - VII

Semester: VI **Hours: 2+1***

Code : 20PH6CP07 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Construct logic circuits using IC's.	PSO - 3	Ap
CO-2	Construct counters using IC's.	PSO - 3	Ap
CO-3	Execute the basic programs in microprocessor.	PSO - 3, 5	Ap

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

Semester: VI				**MAJOR CORE PRACTICAL - VII**							**Hours: 2+1***
Code : 20PH6CP07											**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	5	5	2	2	2	4	4	5	3	2	3.45
CO-2	4	5	5	2	2	2	4	4	5	3	2	3.45
CO-3	4	5	5	2	2	2	4	4	5	3	2	3.45
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS

1. Construction and verification of truth tables of Boolean laws.
2. Construction and verification of truth tables for of Ring counters.
3. Construction and verification of truth tables for Shift registers.
4. Construction of Full adder & Full subtractor.
5. Construction and verification of truth tables for Asynchronous counter - mod 4 & mod 16.
6. Construction and verification of truth tables Mod 5 counter & Mod 10 Counter.
7. Construction of Differentiator & Integrator using Op-amp .
8. To perform Addition & Multiplication operations using Intel 8085 μP.
9. To perform Subtraction & Division using Intel 8085 μP.
10. To arrange the given set of binary numbers in Ascending and Descending order using Intel 8085 μP.

SOUND AND SOLAR ENERGY

Semester: VI **Hours: 4**
Code : 20PH6DE4A **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain types of vibrations and acoustic properties	PSO - 1	K, U
CO-2	Describe the production, detection and applications of ultrasonic waves	PSO - 1, 2	U, AN
CO-3	Discuss the solar radiation and various types of solar collectors.	PSO - 1, 2	U, AN
CO-4	Demonstrate various applications of solar energy.	PSO - 1, 2, 3	U, AP, AN

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

Semester: VI				**SOUND AND SOLAR ENERGY**							**Hours: 4**
Code : 20PH6DE4A											**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	3	4	3	2	4	4	4	3	2	3.36
CO-2	4	4	4	4	2	3	3	4	4	2	3	3.18
CO-3	5	5	4	4	3	3	5	5	5	4	3	3.18
CO-4	5	5	4	4	4	3	5	4	5	4	3	3.27
CO-5	5	4	3	3	2	2	4	5	3	2	2	3.1
Overall Mean Score												**3.21**

Result: The score for this course is **3.21** (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: WAVES AND WAVE MOTION

Types of waves - Characteristics - Phase velocity and group velocity - Stationary waves - Beats and its uses - Vibration in gas columns - Resonance column experiment - Kund's tube - Velocity and frequency of transverse waves in stretched strings - Laws of transverse vibrations - Sonometer - Electrically maintained tuning fork. **(12 Hours)**

UNIT II: SOUND

Free Vibrations - Undamped Vibrations - Damped Vibrations - Forced Vibrations - Resonance and Sharpness of Resonance - Phase of Resonance - Quality Factor - Fourier Theorem - Fourier Series - Evaluation of Fourier Coefficients - Square wave - Saw- Tooth Wave - Wave Velocity and Group Velocity. **(12 Hours)**

UNIT III: ULTRASONICS

Doppler Effect - Observer at Rest and Source in Motion - Source at rest and Observer in Motion Ultrasonics - Production of Ultrasonic Waves - Detection of Ultrasonic Waves - Acoustic Grating - Acoustic of Ultrasonic Waves. **(12 Hours)**

UNIT IV: ACOUSTICS

Acoustics - Reverberation - Sabine's Reverberation Formula - Determination of Absorption Coefficient - Acoustic Intensity - Acoustic Measurements - factors affecting the Acoustics of Buildings - Sound Distribution in an Auditorium - Requisites for good Acoustics. **(12 Hours)**

UNIT V: SOLAR ENERGY AND ITS APPLICATIONS

Solar constant - Solar Radiation at the earth's surface - Solar radiation Measurements - Flat - Plate collectors - Thermal Analysis of Flat - Plate collectors and useful heat Gained by the Fluid-Solar water heating - space heating (or solar heating of buildings) - Solar electric Power generation : solar photovoltaics - Solar distillation - Solar Pumping - Solar Furnace - Solar cooking. **(12 Hours)**

BOOK FOR STUDY:

- Study material prepared by Dr. A. Clara Dhanemozhi, Associate Professor of Physics, J.A. College for Women, Periyakulam

BOOKS FOR REFERENCE

1. A Text Book of Sound - N Subramaniyam Brij Lal, S.Chand & Co, New Delhi Second Reprint, 2013.
2. Non conventional energy sources, G.D.Rai - Khanna Publishers - Fifth Edition, 2011.

HOME APPLIANCES AND SERVICING

Semester: VI **Hours: 4**

Code : 20PH6DE4B **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Analyze the working principles of electric circuits.	PSO - 1, 3	U, An
CO-2	Describe the wiring techniques.	PSO - 3, 4	An, AP
CO-3	Illustrate about the different types of lamps.	PSO - 1, 2	C, An
CO-4	Analyze the applications of electronic appliances.	PSO - 2, 3	An, AP
CO-5	Explain the magnetic effects of current.	PSO - 1	An

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

Semester: VI				**HOME APPLIANCES AND SERVICING**							**Hours: 4**
Code : 20PH6DE4B											**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	3	5	2	4	4	5	4	5	3	4	4.0
CO-2	5	4	5	3	4	3	4	3	5	5	3	4.0
CO-3	5	4	4	3	3	3	3	5	5	4	4	3.9
CO-4	5	4	5	3	4	3	3	5	5	3	4	4.0
CO-5	5	3	4	3	3	3	5	3	3	3	5	3.63
Overall Mean Score												**3.91**

Result: The score for this course is **3.91** (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

Supply systems - Series, Parallel circuit - Alternating and direct currents - Voltages - Power calculation - Basic components used in electrical and electronic circuitry - Multimeter. **(12 Hours)**

UNIT II: WIRING TECHNIQUES

Types of wires - Tools for wiring - Types of plugs - Types of switches - Soldering iron - Wiring techniques - Fuse, earthing - House hold wiring - Safety measures. **(12 Hours)**

UNIT III: LAMPS

Incandescent lamp - Fluorescent lamp - Emergency light - Practical - Series and parallel connection - Fuse - Tube light and bulb connection - Measuring current and voltage using multimeter - Soldering. **(12 Hours)**

UNIT IV: APPLICATIONS

Electric Iron - Immersion rod - Geyser - Electric cooker - Electric stove - Microwave oven - CD Player - DVD player - DTH services. **(12 Hours)**

UNIT V: MAGNETIC EFFECT OF CURRENT

Principle and working of motor - Dynamo - Fan - Types of fan - Mixer Grinder - Washing machine - Vacuum cleaner - Fridge - AC - Principle and working of Television - Voltage stabilizer - UPS. **(12 Hours)**

BOOK FOR STUDY

- Study material prepared by Dr. A. Clara Dhanemozhi, Department of Physics, Jayaraj Annapackiam College for Women (Autonomous), Periyakulam.

BOOKS FOR REFERENCE

1. The Universal Encyclopedia of Machines, How Things Work 1 - Harper Collins Publishers India - Volume I - 1992.
2. George Daniels - How to be your own Electrician (Everyday handbooks) - Joanna Cotler Books - 1974.
3. Related Websites.

ASTRONOMY AND ASTROPHYSICS

Semester: VI **Hours: 4**

Code : 20PH6DE4C **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Discuss the characteristics of Earth and Moon.	PSO - 1	K, U
CO - 2	Explain various aspects of Solar system, in general and Planets, in particular.	PSO - 2, PSO - 3	Ap, An
CO - 3	Describe the properties and different layers of Sun.	PSO - 3, PSO - 4	Ap, C
CO - 4	Formulate the theories and properties of Stars and Galaxies.	PSO - 1, PSO - 3	U,Ap
CO - 5	Classify the different stages of stars in stellar evolution.	PSO - 2, PSO - 3	Ap, An

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

Semester: VI			**ASTRONOMY AND ASTROPHYSICS**						**Hours: 4**		
Code : 20PH6DE4C											**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	4	3	2	2	5	4	4	3	3	3.54
CO - 2	4	5	5	2	3	2	4	5	5	2	2	3.54
CO - 3	4	4	5	5	2	2	4	4	5	5	4	4.00
CO - 4	5	5	4	3	2	2	5	4	5	4	2	3.72
CO - 5	5	5	4	2	3	2	4	5	5	3	2	3.63
Overall Mean Score												**3.69**

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

Note:

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

Values Scaling:

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

UNIT I: THE EARTH AS A CELESTIAL BODY

The orientation of earth in space - The celestial sphere - Terrestrial sphere - Arc and time units - Sidereal time - Apparent solar time - Mean solar time - Local time - International data line. **(12 Hours)**

UNIT II: SOLAR SYSTEM

Classification of planets - Satellites - Bode's law - Asteroids - Meteoroids - Meteor Shower - Comets - Cometary dust. **(12 Hours)**

UNIT III: SUN

Sun - physical properties - Composition - The photosphere - The Chromosphere - The Corona - Solar vibrations - Sun Spots - Sun Spot Cycle - Solar Prominences - Solar flares. **(12 Hours)**

UNIT IV: STARS

Birth of Star - Main Sequence stars - Origin of red giant stars - Color magnitude diagrams - Neutron Stars - Black holes. **(12 Hours)**

UNIT V: GALAXIES

Galaxies - Milky Way - Stellar populations - Types of galaxies - Elliptical galaxy, Spiral galaxy, Irregular galaxy, Properties - Quasars - Origin of galaxies.

(12 Hours)

BOOK FOR STUDY:

- Introductory Astronomy, Nicolas and Thomas, Wesley publishing company II

DETAILED REFERENCES:

- Introductory Astronomy, Nicolas and Thomas, Wesley publishing company II

UNIT I: Chapter 6: 6.1 to 6.14

UNIT II: Chapter 8: 8.1 to 8.6, Chapter 9: 9.1,9.13,9.18,9.19.

UNIT III: Chapter 10: 10.1 to 10.6,10.8,10.10,10.12,10.13.

UNIT IV: Chapter 13: 13.6 to 13.9,13.11,13.12.

UNIT V: Chapter 15: 15.1,15.3,15.12 - 15.15,15.19,15.20

BOOKS FOR REFERENCE:

1. Astrophysics galaxies stars, K.D.Abhyankar, Universities press and Pvt,Ltd - India 2001.
2. S.Kumaravelu and Susheela Kumaravelu - Astrophysics - Shree Vishnu Arts, Sivakasi - 2004

DIGITAL PHOTOGRAPHY

Semester: VI **Hours: 2**

Code : 20PH6GE02 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Classify the types of camera.	PSO - 1	U
CO-2	Explain the principles of Digital Camera and handle it.	PSO - 3	Ap
CO-3	List the specifications and usages of storage cards and sensors.	PSO - 2	An
CO-4	Utilize the Photoshop skills to improve the quality of the pictures	PSO - 3	Ap
CO-5	Edit and save images in different file formats.	PSO - 5	C

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

Semester: VI				**DIGITAL PHOTOGRAPHY**							**Hours: 2**
Code : 20PH6GE02											**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	5	4	5	3	3	4	4	3.7
CO-2	3	3	3	3	5	3	3	3	5	3	3	3.3
CO-3	4	4	4	3	3	3	3	5	3	4	4	3.6
CO-4	4	4	4	3	3	3	3	3	5	3	3	3.4
CO-5	4	3	4	3	3	3	2	3	3	3	5	3.2
Overall Mean Score												**3.22**

Result: The score for this course is **3.22** (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

Camera - Basic parts of the camera - Three important controls of the camera - Types of camera (Box camera, TLR, SLR). **(6 Hours)**

UNIT II

Digital camera - Parts of a diagram - Working - Handling a dig cam - Advantages - Disadvantages. **(6 Hours)**

UNIT III

Storage card - Compact flash, smart media secure digital (SD) - Multimedia card (elementary ideas) - Pixels - Sensors (CCD & CMOS) - Difference between digital zooming and optical zooming. **(6 Hours)**

UNIT IV

Photoshop program window (title bar, menu bar, option bar) - Image window (image title bar, status bar, rulers) - Toolbox. **(6 Hours)**

UNIT V

Creating new file - Image size - Image resolution - File format (JPEG, PSD), Editing images - rotating - Cropping - Brightness and color correction. **(6 Hours)**

BOOK FOR STUDY

- Study material prepared by Ms. T. Nithya, Assistant professor in physics, Jayaraj Annapackiam College for Women (Autonomous), Periyakulam.

BOOKS FOR REFERENCE:

1. Tom Ang - Fundamentals of Modern Photography - Octopus Publishing Group Ltd. - 2008.
2. Vikas Guptha - Complex DTP Course Kit - Dreamtech Press, New Delhi -2008.
3. S. Thiagarajan - Practical Photography, VI Edition - Sultan & Chand Publications - 2006.
4. Carla Rose - Teach yourself Digital Photography in 14 days, 1st edition - Hayden Books' Techmedia, New Delhi - 1997.

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 $2 \times 7 = 14$

WORKSHOP PRACTICE

Semester: VI **Hours: 2**

Code : 20SE6PH04 **Credits: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Handle the tools and measuring instrument.	PSO - 1	U
CO-2	Mae L-Joint for a steel plate.	PSO - 3	AP
CO-3	Drill a hole of required size.	PSO - 3	AP
CO-4	Use the Electrical tool for simple wiring.	PSO - 6	AP
CO-5	Do different types of soldering.	PSO - 3	AP

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

Semester: VI				**WORKSHOP PRACTICE**							**Hours: 2**
Code : 20SE6PH04											**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	3	4	5	3	4	4	4	4	3.81
CO-2	4	4	4	3	4	3	5	2	4	4	4	3.72
CO-3	3	2	5	3	4	4	4	4	4	4	5	3.81
CO-4	5	5	5	4	5	4	3	2	4	3	4	4.0
CO-5	4	2	4	4	4	3	4	4	4	3	5	3.45
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

LIST OF PRATICALS:

1. Introduction to Hand tools and measuring instruments.
2. To make L Joint from the given mild steel plate.
3. To drill a hole of required size (m8) and to tap the inner thread on the hole.
4. To drill a hole of required size (m10) and tap the inner thread on the hole.
5. Electrical shop1- Inductive, capacitive, reactance calculator, using Resistor ID pro tool box.
6. Electrical shop 2- Usage of Electrician side kick.
7. Electrical shop -3- Usage of electrical tools Lite.
8. Electronic shop -1- Types of wire and fuse.
9. Electronic shop - 2 - Types of soldering

BIOMEDICAL INSTRUMENTATION

Semester: VI

Code : 20PH6SS01 **Credits: 2***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Illustrate the design of medical instruments.	PSO - 1	K, U
CO-2	Analyze the working of ECG, EEG and EMG.	PSO -1, 2	U, An
CO-3	Explain function of pace makers and internal organ machines.	PSO -1	K, U
CO-4	Explain the working of medical instruments.	PSO -1	K, U
CO-5	Describe modern imaging systems.	PSO- 1, 2	U, An

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

Semester: VI				**BIOMEDICAL INSTRUMENTATION**							**Credits: 2***
Code : 20PH6SS01											
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	4	4	3	3	4	3	4	5	4	3	2	3.55
CO-2	4	3	4	2	3	4	5	4	4	3	3	3.55
CO-3	4	4	3	4	4	3	4	3	3	3	2	3.36
CO-4	4	3	3	4	4	5	4	4	3	2	3	3.54
CO-5	3	3	4	3	3	3	3	4	3	4	3	3.27
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: BIOPOTENTIAL ELECTRODES AND TRANSDUCERS

Transport of ions through cell membrane - Bio electric potential - Design of medical instruments - Electrodes - Micro & Surface - Transducers (active tranducers only).

UNIT II: BIO SIGNAL AMPLIFIERS AND RECORDERS

Isolation amplifier - Medical pre amplifier design - Chopper amplifier - Bio signal analysis - Characteristics of recording systems - Electrocardiography - Encephalography - Electromyography - Accuracy of recorders.

UNIT III: PHYSIOLOGICAL ASSIST DEVICES

Pace makers - Artificial heart valves - Defibrillators - Nerve and muscle stimulators - Heart lung machine - Kidney machine.

UNIT IV: SPECIALIZED MEDICAL EQUIPMENTS

Blood flow meters - Gas analyzers - Oxymeters - Blood cell counters - Electron microscope - Radiation detectors - Photometers and calorimeters - Digital thermometers - Audio meters - X-ray tube - X-ray Machine.

UNIT V: MODERN IMAGING SYSTEMS

Lasers in medicine - Endoscopes - Cryogenic Surgery - Nuclear imaging Techniques - Computer Tomography - Thermography - Ultrasonic imaging system - Magnetic resonance Imaging - Positron emission tomography - Digital subtraction angiography.

BOOK FOR STUDY:

- Dr. M. Arumugam - Bio medical Instrumentation - Anuradha Publication - 2006.

DETAILED REFERENCE:

- Dr. M. Arumugam - Bio medical Instrumentation - Anuradha Publication - 2006.

  UNIT I : Chapter 1: 1.4 to 1.6

  Chapter 2: 2.2, 2.3, 2.4-2.4.1 to 2.4.5, 2.5

  UNIT II : Chapter 3: 3.3, 3.4, 3.8, 3.9.1 to 3.9.4, Chapter 4: 4.2 to 4.5, 4.7

  UNIT III: Chapter 5: 5.1, 5.2, 5.4 to 5.8

  UNIT IV : Chapter 6: 6.10, 6.13, 6.15, Chapter 7: 7.2 to 7.9

  UNIT V : Chapter 10: 10.3 to 10.12

PARTICLE ACCELERATORS AND DETECTORS

Semester: VI

Code : 20PH6SS02 **Credits: 2***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Classify various elementary particles in cosmos.	PSO - 1	K, U
CO - 2	Explain the detection of electron and neutron.	PSO - 1, PSO - 2	U, An
CO - 3	Compare the working of different particle accelerators.	PSO - 1	K, U
CO - 4	Describe the construction and operation of various particle detectors.	PSO - 1	K, U
CO - 5	Analyze the hazardous effects in the nuclear reactors.	PSO - 1, PSO - 2	U, An

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

Semester: VI			**PARTICLE ACCELERATORS AND DETECTORS**						**Credits: 2***			
Code : 20PH6SS02												
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	3	3	4	3	4	5	4	3	2	3.55
CO - 2	4	3	4	2	3	4	5	4	4	3	3	3.55
CO - 3	4	4	3	4	4	3	4	3	3	3	2	3.36
CO - 4	4	3	3	4	4	5	4	4	3	2	3	3.54
CO - 5	3	3	4	3	3	3	3	4	3	4	3	3.27
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: COSMIC RAYS AND INTERACTON WITH MATTER

Discovery of Cosmic Rays - Latitude Effect - East-West Effect (Azimuth Effect) - Altitude Effect - Primary Cosmic Rays - Secondary Cosmic Rays - Cosmic Ray Showers - Discovery of Positron - The Mesons - Van Allen belts - Origin of Cosmic Rays. Rate of loss of energy of a charged particle traversing a material medium - Bremsstrahlung - Neutron decay - Stability of Proton - Resonance particles - Detection of neutrino - Calculation of energy of photon in γ-decay

UNIT II: ELECTRON AND NEUTRON DETECTION

`Electron - Dunnington's method for determining e/m - Constituents of Cathode Ray Oscilloscope (CRO) - Deflection sensitivity of a CRO of electrostatic type - Time Base - Applications of CRO - Block diagram of CRO - Discovery of Neutron - Basic properties of Neutron - Classification of Neutrons - Neutron Sources - Neutron Detection - Neutron Collimator

UNIT III: PARTICLE ACCELERATORS

Van de Graaff generator - The Linear Accelerator - The Cyclotron - The Synchrocyclotron - The Betatron - The Synchrotrons - The Proton Synchrotron (Bevatron, Cosmotron)

UNIT IV: DETECTORS OF NUCLEAR RADIATIONS

Interaction between Energetic Particles and Matter - Ionization chamber - Solid State detectors - Proportional Counter - Geiger Muller Counter - The Wilson Cloud Chamber - Diffusion Cloud Chamber - Bubble Chamber - Spark Chamber - Nuclear Emulsions - The Scintillation Counters - Cerenkov Counter.

UNIT V: NUCLEAR REACTORS AND RADIATION HAZARDS

Pressurized Water Reactor (PWR) - Boiling Water Reactor (BWR) - Fast Breeder Reactor - Neutron Cycle in a Thermal Nuclear Reactor - Fusion Reactors - Plasma Confinement - Radiation hazards - Radiation levels for safety - Radiation protection methods - Nuclear Disasters - Nuclear Waste disposal

BOOK FOR REFERENCE:

- Modern Physics - R. Murugeshan and Er. Kiruthiga Sivaprasath - S. Chand & Company Ltd, New Delhi - Sixteenth Edition, 2012

DETAILED REFERENCE

UNIT I : Chapter 37: 37.1 - 37.11; Chapter 40: 40.1 - 40.7

UNIT II : Chapter 10: 10.1 - 10.6; Chapter 34: 34.12 - 34.17

UNIT III : Chapter 30: 30.1 - 30.8

UNIT IV : Chapter 29: 29.1 - 29.13

UNIT V : Chapter 36: 36.1 - 36.6; Chapter 32: 32.1 - 32.5

APPLICATIONS OF SOLAR ENERGY

Semester: VI

Code : 20PH6SS03 **Credits: 2***

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Conceptualize the heat transfer.	PSO - 1	K, U
CO - 2	Design various solar collectors.	PSO - 1, PSO - 2	U, An
CO - 3	Explain the water heating systems.	PSO - 1	K, U
CO - 4	Compare different types of concentrators.	PSO - 1	K, U
CO - 5	Explore various energy storages.	PSO - 1, PSO - 2	U, An

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

Semester: VI			**APPLICATIONS OF SOLAR ENERGY**						**Credits: 2***			
Code : 20PH6SS03												
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	3	3	4	3	4	5	4	3	2	3.55
CO - 2	4	3	4	2	3	4	5	4	4	3	3	3.55
CO - 3	4	4	3	4	4	3	4	3	3	3	2	3.36
CO - 4	4	3	3	4	4	5	4	4	3	2	3	3.54
CO - 5	3	3	4	3	3	3	3	4	3	4	3	3.27
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: SOLAR ENERGY

Introduction - solar spectrum - solar radiation - terrestrial and extraterrestrial regions - solar time - Instruments - pyrheliometer - pyranometer - sunshine recorders- Sun - Earth Angles.

CONCEPTS OF HEAT TRANSFER

Introduction - Conduction - Temperature Field - Fourier's Law - Thermal conductivity - differential equation of conduction - solution of heat conduction in a medium - Boundary Conditions - Convection - Dimensionless Heat convection Parameter - Bulk Temperature - Free Convection - Radiation - Radiation involving Real Surface - Kirchoff's Law - Law of Thermal Radiation.

UNIT II: FLAT PLATE COLLECTORS

Introduction - Flat Plate Collector - glazing materials - Collector plates - Classification - Evacuated tubular collectors- Type of flat plate collector - Heat Transfer Coefficients -top loss coefficients - Back loss coefficient - Edge loss coefficient - Optimization Of Heat Losses - Transparent insulating material (honeycomb) - selective surface - Determination of Fin Efficiency.

EVACUATED SOLAR COLLECTOR

Introduction - Evacuated tube Cover Collector - Solaron Collector - Phillips (Germany) Collector - Thermal efficiency - Evacuated-tubular Collector - Sanyo evacuated-tube Collector - Corning evacuated tube collector - Phillips (Germany) evacuated tube collector - Robert's evacuated tube collector.

UNIT III: SOLAR WATER HEATING SYSTEM

Introduction - Heat Exchanger - Choice of fluid - Analysis of heat exchanger - Heat collection in a storage tank - Heat collection with stratified storage tank.

SOLAR AIR HEATERS

Introduction - Description and classification - Non porous type - porous type - Conventional Heater - Thermal analysis - Double exposure heaters - Air heater with flow above the absorber - steady state analysis - Transient analysis.

UNIT IV: SOLAR CROP DRYING

Introduction - Working principle - Open sun drying (OSD) - Direct solar drying(DSD) - Indirect solar drying(ISD).

SOLAR CONCENTRATOR

Introduction - characteristic Parameters - Aperture area - Acceptance angle - Absorber angle - Geometric concentration ratio - Local concentration ratio or brightness concentration ratio - intercept factor - optical efficiency - thermal efficiency - Concentration ratio - Classification - Types of concentrators - Tracking concentrators - Non- tracking concentrators.

UNIT V: ENERGY STORAGE

Introduction - Sensible heat storage - Liquid media storage - Well mixed liquid storage - Space heat and hot water - Solid media storage - Packed-bed storage

PHOTONIC SYSTEM

Introduction - Doping - Fermi level - p-n Junction - p-n Junction Characteristics - Photovoltaic Effect - Photovoltaic Material - Single crystal solar cell - Thin film solar cell - Amorphous Si solar cell - Tandem solar cell - Concentrating solar cell.

BOOK FOR STUDY:

- G.N. Tiwari - Solar Energy fundamental, designs, modeling and applications - Narosa Publication - 2013.

DETAILED REFERENCE:

- G.N. Tiwari - Solar Energy fundamental, designs, modeling and applications - Narosa Publication - 2013.

UNIT I :	Chapter 1 : 1.3 to 1.6
	Chapter 2: 2.1 to 2.3, 2.6, 2.6.1 to 2.6.3, 2.7, 2.7.1 to 2.7.3
UNIT II:	Chapter 3: 3.1 to 3.3, 3.5,3.5.1 to 3.5.3, 3.6, 3.7
	Chapter 4: 4.1, 4.2 to 4.3, 4.3.1 to 4.3.4
UNIT III:	Chapter 5: 5.1, 5.2, 5.2.1, 5.2.2, 5.3, 5.3.1
	Chapter 6: 6.1 to 6.5
UNIT IV:	Chapter 7: 7.2, 7.2.1 to 7.2.3
	Chapter 8: 8.1 to 8.4
UNIT V:	Chapter 12: 12.1 to 12.4
	Chapter 13: 13.1 to 13.7

HOW THINGS WORK

Semester: VI

Code : 20PH6SS04 **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 Physics principles of domestic appliances.	PSO - 1	U
CO - 2	Compare various types of lamps and musical instruments.	PSO - 2	An
CO - 3	Describe usage of metallurgy in industries.	PSO - 1	K
CO - 4	Recognize the hydraulic power systems and preliminaries of aerodynamics.	PSO - 1	K
CO - 5	Explain the working principles of camera.	PSO - 1	U

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

Semester: VI				**HOW THINGS WORK**							**Credits: 2***
Code : 20PH6SS04											
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	3	3	4	3	4	5	4	3	2	3.55
CO - 2	4	3	4	2	3	4	5	4	4	3	3	3.55
CO - 3	4	4	3	4	4	3	4	3	3	3	2	3.36
CO - 4	4	3	3	4	4	5	4	4	3	2	3	3.54
CO - 5	3	3	4	3	3	3	3	4	3	4	3	3.27
Overall Mean Score												**3.45**

Result: The score for this course is **3.45** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: DOMESTIC APPLIANCES

Electric bell - Door locks - Fans, Blowers and Centrifugal compressors - Refrigerator - Air conditioning - Vacuum cleaner - Sewing machine - Flat iron- Tape recorder - Washing machine - Fuse

UNIT II: LIGHT AND MUSIC

Compact Fluorescent lamp - Incandescent lamp - Colour television - Pianoforte - Piano tone and tuning - Accordion - Electric organ - Electronic music.

UNIT III: METALLURGY

Powder metallurgy - Forging - Cutting and machining of metals - Pressure welding - Fusion welding - Soldering - Metal spraying.

UNIT IV: AIRCRAFT

Present day method of aircraft construction - Airfoils and airflow - Wind tunnel - Hydraulic power system - Vertical takeoff and landing aircraft (VTOC).

UNIT V: CAMERA

Cameras: General Introduction - Focal length and size of image - Interchangeable lenses - Diaphragm shutters - Depth of field - Range finder - Video camera - Projectors - Color photography.

BOOK FOR STUDY

- The Universal Encyclopedia of Machines - How Things Work 1 & 2 - Harper Collins Publishers India - Volume I - 1992.

SELF- STUDY COURSE - EXTERNAL QUESTION PATTERN

Time: 3 hrs **Marks: 100**

SECTION - A

Answer 8 questions out of 10 (2 questions from each unit) (8 × 3 = 24)

SECTION - B

Answer all questions (Internal choice) (1question from each unit) (5 × 8 = 40)

SECTION - C

Answer 3 questions out of 5 (1 question from each unit) (3 × 12 = 36)

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

(Certificate Course)

Code	Title of the Course	Hours	Credit
20PH1SD01	Mobile Technology	60	2

Continuous Internal Assessment Component (CIA)

Theory:

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

The Components for Internal and External Exams are at the discretion of the Department.

Continuous Internal Assessment Component (CIA)

Passing Minimum for Continuous Internal Assessment (CIA)	
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)

Internal Question Pattern

Part - A

10 Questions × 2 Marks = 20 Marks (10 Questions out of 15)

Part - B

5 Questions × 4 Marks = 20 Marks (5 Questions out of 8)

External Question Pattern

Part - A

15 Questions × 3 Mark = 45 Marks (15 Questions out of 20)

(Four Questions from each Unit)

Part - B

5 Questions × 6 Marks = 30 Marks (5 Questions out of 8)

(Atleast One Question from each Unit**)**

SKILL DEVELOPMENT PROGRAMME (SDP) (CERTIFICATE COURSE)

MOBILE TECHNOLOGY

Code: 20PH1SD01 **Hours: 60**

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 concepts of electronic components.	PSO - 1	K
CO-2	Describe cellular communication systems.	PSO - 1	U
CO-3	Perform IC Installation, removal and analyze the jumper system.	PSO - 3	Ap
CO-4	Recite types of displays and their replacement methods.	PSO - 2	An
CO-5	Explain Flashing techniques of mobile phones.	PSO - 1	U

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

Code: 20PH1SD01				**MOBILE TECHNOLOGY**							**Hours: 60** / **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	3	2	2	2	5	4	3	3	2	3.18
CO-2	5	4	3	2	2	2	5	4	4	3	3	3.36
CO-3	5	4	4	2	2	2	4	4	5	3	2	3.36
CO-4	5	3	3	3	2	2	4	5	3	4	2	3.36
CO-5	5	4	4	3	2	2	5	4	4	3	3	3.36
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 = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos= $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I: MOBILE GENERATIONS

How basically Cell Phone Works - Cellular Communication - Power Supply Unit- Current - Voltage - Power - Frequency - Basic of Electronics - Resistor - Capacitor - Inductor - Transistor - Diode - Oscillator - Light Emitting Diode - Fuse - Integrated Chip - Mobile Communication - Transmitting Section - Receiving Section - Virus - Mobile Locks - Security Code - Personal Identification Number. **(12 Hours)**

UNIT II: CELLULAR COMMUNICATION SYSTEM

IC Name and Working System - External Parts Names and Working - Common Mobile PC Board Diagram - Magnetometer and GPS - Gyroscope - Accelerometer - Proximity sensor - Barometer - Thermometer - Air humidity sensor - Pedometer - Biometrics - Augmented & Virtual Reality - Trouble Shooting - Mobile Phone Repairing Equipments - Mobile Phone Open Method - External Parts Check Up. **(12 Hours)**

UNIT III: INTERNAL PARTS PROBLEM IDENTIFICATION METHOD

Warm Up - IC Remove - IC Install - IC Remove Practice - IC Install Practice - External Parts Replacing Method - External Parts Replacing Method Practice - Jumper System - Jumper System Practice. **(12 Hours)**

UNIT IV: TYPES OF DISPLAY

Display replacing method in various mobile phone models - Types of Touch screens used in the mobile phones - Touch Replacing method in various mobile phone models - Combo display replacing method. **(12 Hours)**

UNIT V: MOBILE PHONE SOFTWARE

Mobile Phone Software Introduction - Flashing Method of China Mobiles - Android Versions - Flashing Method of Samsung Mobiles. Flashing method using ODIN - Flashing method using SPF tool. **(12 Hours)**

Practical - 10 Hours (to be assessed at the end of the semester)

BOOK FOR STUDY:

- Study material provided by e-CareerPluz Info (India) Private Limited, Madurai (An ISO 9001:2008 Certified Institution) on "Mobile phone technology".

BOOKS FOR REFERENCE:

1. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj - Electronic Devices & Circuits, II Edition - Tata McGraw-Hill - 2003.
2. Jochen Schiller - Mobile Communication, II edition - Dorling Kindersley (India) Pvt. Ltd. - 2009.

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

	PAPER I: LIFE OF MAHATMA GANDHI - CCHYGT01											Hours: 1
Code: CCHYGT01												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