JAYARAJ ANNAPACKIAM COLLEGE FOR WOMEN (AUTONOMOUS)

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

PERIYAKULAM – 625 601, THENI DT. TAMIL NADU.

B.Sc. PHYSICS

(2023-2026)

PG AND RESEARCH CENTRE OF PHYSICS

U.G. PROGRAMME OUTCOMES

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

U.G. PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAM THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Define the Fundamentals of Physics and understand their applications in real time situation.	PO - 1
2.	Solve and interpret problems by applying the concepts and laws of Physics.	PO - 6
3.	Experiment the acquired knowledge through Practicals and utilize them to design independent projects.	PO - 4
4.	Explain the basic principles of physics and lay a foundation to interdisciplinary sciences.	PO - 3
5.	Imbibe communication, computational and Entrepreneurial skills.	PO - 2, PO - 5

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

Sem.	Part	Code	Title of the Course	Hours	Credit
I	I	23GT1GS01/ 23GH1GS01	Tamil-I/ Hindi-I	6	3
	II	23GE1GS01	English-I	4	3
	III	23PH1MC01	Properties of Matter and Sound	6	6
		23PH1MC02	# Physics For Everyday Life	2	2
		23PH1CP01	Major Practical – I	3	-
		23MA1AC1A/ 23MA1AC1B	Allied Mathematics-I: Essential Mathematics – I/ Calculus of Finite Differences	5	4
	IV	23AE1PE01	**#Ability Enhancement Course-1 (AEC-1)** **(Soft skill - 1)** Professional English	2	2
	IV	23PH1FC01	**#Foundation Course:** Introductory Physics	2	2
	V	23STPNS01/ 23STPNC01/ 23STPPE01/ 23STPCC01/ 23STPRR01/ 23STPRC01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	-
			Total	**30**	**22**
II	I	23GT2GS02/ 23GH2GS01	Tamil-II/ Hindi-II	6	3
	II	23GE2GS02	English-II	4	3
	III	23PH2MC03	Heat and Thermodynamics	4	4
		23PH2MC04	Electricity and Electromagnetism	4	3
		23PH2CP01	Major Practical – I	3	3
		23MA2AC2A/ 23MA2AC2B	Allied Mathematics-II: Essential Mathematics - II/Classical Algebra	5	4
	IV	23AE2VE02	**#Ability Enhancement Course-2 (AEC-2)** Sustainability Life Skills	2	2
		23SE2CE02	**# Skill Enhancement Course-2 (SEC - 1)** Effective English	2	2
	V	23STPNS01/ 23STPNC01/ 23STPPE01/ 23STPCC01/ 23STPRR01/ 23STPRC01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	-
			Total	**30**	**24**

Sem.	Part	Code	Title of the Course	Hours	Credits
III	I	23GT3GS03/ 23GH3GS03	Tamil-III/ Hindi-III	6	3
	II	23GE3GS03	English-III	4	3
	III	23PH3MC05	Mechanics	6	6
		23PH3CP02	Major Practical – II	4	3
		23CH3AC3A/ 23CH3AC3B	Allied Chemistry - I: General Chemistry-I/ General Aspects of Chemistry-I	3	3
		23CH3AP3A/ 23CH3AP3B	Allied Chemistry Practical-I: Organic Analysis/ Semimicro Inorganic Qualitative Analysis	2	1
	IV	23SE3PH03	# **Skill Enhancement Course-2 (SEC - 2)** (Entrepreneurial Based)-Digital Photography	1	1
		23PH3GE01/ 23GE3NC01	# Generic Elective-I Physics of Music/ National Integration and Personality Development	2	2
		23AE3ES03	# **Ability Enhancement Course-3 (AEC-3)** Environmental Studies	2	2
	V	23STPNS01/ 23STPNC01/ 23STPPE01/ 23STPCC01/ 23STPRR01/ 23STPRC01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	-
			Total	**30**	**24**
IV	I	23GT4GS04/ 23GH4GS04	Tamil-IV/ Hindi-IV	6	3
	II	23GE4GS04	English-IV	4	3
	III	23PH4MC06	Optics and Spectroscopy	6	6
		23PH4CP03	Major Practical – III	3	2
		23CH4AC4A/ 23CH4AC4B	Allied Chemistry -II: General Chemistry-II/ General Aspects of Chemistry-II	3	3
		23CH4AP4A/ 23CH4AP4B	Allied Chemistry Practical - II: Volumetric Analysis/ Quantitative Estimation	2	1
	IV	23SE4OA4B	# **Skill Enhancement Course-3 (SEC - 3)** Office Fundamentals	3	2
		23PH4GE02/ 23GE4NC02	# Generic Elective – II: Astrophysics/ Organization and Health Programme in NCC	2	2
		23AE4CB04	# **Ability Enhancement Course-4 (AEC-4)** Capacity Building	1	1
	V	23STPNS01/ 23STPNC01/ 23STPPE01/ 23STPCC01/ 23STPRR01/ 23STPRC01	**Students Training Programme:** National Service Scheme/ National Cadet Corps/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	1*
			Total	**30**	**23+1***

Sem.	Part	Code	Title of the Course	Hours	Credits
V	III	23PH5MC07	Atomic Physics and Lasers	6	5
		23PH5MC08	Modern Physics	6	5
		23PH5CP04	Major Practical – IV	5	3
		23PH5CP05	Major Practical – V	5	3
		23PH5DE1A/ 23PH5DE1B/ 23PH5DE1C	**Discipline Specific Elective - 1** Mathematical Physics Numerical Methods and C Programming Materials Science	4	3
	III	23PH5DE2A/ 23PH5DE2B/ 23PH5DE2C	**Discipline Specific Elective - 2** Analog Electronics Medical Instrumentation Nano Science	4	3
	IV	23PH5IN01/ 23PH5IT01	Internship/ Industrial Training (Carried out in II year Summer Vacation) (30 hours)/Atleast 6 days (IV Sem)	-	2
	V	23SLPEX01	Service Learning Programme: Extension JACEP	-	-
			Total	**30**	**24**
VI	III	23PH6MC09	Nuclear and Particle Physics	5	5
		23PH6MC10	Digital Electronics and Microprocessor 8085	5	4
		23PH6CP06	Major Practical – VI	5	3
		23PH6CP07	Major Practical – VII	5	3
		23PH6PR01	Project*	4	3
		23PH6DE3A/ 23PH6DE3B/ 23PH6DE3C	**# Discipline Specific Elective - 3** Solid State Physics Communication Physics Energy Physics	3	2
	IV	23SE6PH04	**# Skill Enhancement Course-4 (SEC - 4) (Domain specific skill courses)** Workshop Practice	3	2
	V	23PH6SS01/ 23PH6SS02/ 23PH6SS03/ 23PH6SS04/ 23PH6SM01	**# Self Study Course:** Biomedical Instrumentation Atmosphere, Weather and Climatic changes Applications of Solar Energy How things work MOOCs	-	2*
		23SLPEX01	**Service-Learning Programme:** Extension JACEP	-	1
			Total	**30**	**23+2***
			Total	**180**	**140+3***

*** Extra Credits, # Internal**

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

ALLIED CORE COURSES OFFERED BY DEPARTMENT OF PHYSICS

Sem.	Code	Title of the Course	Hours	Credit
I	23PH1AC1A/ 23PH1AC1B	**Allied Physics-I:** Mechanics, Properties of Matter and Thermal Physics/ Gravitation, Heat and Sound	3	3
	23PH1AP1A/ 23PH1AP1B	**Allied Physics Practical-I**	2	1
II	23PH2AC2A/ 23PH2AC2B	**Allied Physics-II:** Electricity, Electronics and Atomic Physics / Optics, Spectroscopy and Modern Physics	3	3
	23PH2AP2A/ 23PH2AP2B	**Allied Physics Practical-II**	2	1
III	23PH3AC3A/ 23PH3AC3B	**Allied Physics - I:** Mechanics, Properties of Matter and Thermal Physics/ Gravitation, Heat and Sound	3	3
	23PH3AP3A/ 23PH3AP3B	**Allied Physics Practical - I:** Properties of Matter Practical/ Properties of Matter, Heat and Sound Practical	2	1
IV	23PH4AC4A/ 23PH4AC4B	**Allied Physics - II:** Electricity, Electronics and Modern Physics/ Optics, Spectroscopy and Relativity	3	3
	23PH4AP4A/ 23PH4AP4B	**Allied Physics Practical - II:** Electricity and Electronics Practical/ Optics, Spectroscopy and Electricity Practical	2	1

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

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

CERTIFICATE COURSE OFFERED BY THE DEPARTMENT

Code	Title of the Course
23PH1SD01	**Skill Development Programme (SDP)** Mobile Technology

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**

PASSING MINIMUM FOR EXTERNAL SEMESTER EXAMINATION -UG

PASSING MINIMUM

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

PROJECT WORK

The ratio of marks for Internal and External Examination is 50:50.

The Internal Components of Project Work are given below:

The Internal Components of Project

Components	**Marks**
First Review	10
Second Review	10
Final Review (Internal Viva Voce)	30
Total	**50**

External Valuation of Project Work

Components	**Marks**
Project Report	25
External Viva Voce	25
Total	**50**

INTERNAL QUESTION PATTERN - UG

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

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

INTERNAL QUESTION PATTERN (Fully Internal Papers)-UG

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

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

UG - EXTERNAL QUESTION PATTERN

For Credits 5 and above

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

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

UG - EXTERNAL QUESTION PATTERN

For Below 5 Credits

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

பொதுத்தமிழ் - 1 (பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: ஒன்று **நேரம்: 6**

குறியீடு: 23GT1GS01 **புள்ளி: 3**

COURSE OUTCOMES:

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

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

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

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

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

Note:

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

Values Scaling:

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

அலகு 1: மரபுக் கவிதை

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

அலகு 2: புதுக்கவிதை

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

அலகு 3: சிறுகதைகள்

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

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

அலகு 5: மொழித்திறன் போட்டித் தேர்வு

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

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

பாட நூல்கள்

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

பார்வை நூல்கள்:

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

11. ஜெயகாந்தன் - ஜெயகாந்தன் சிறுகதைகள்,
கவிதா பப்ளிகேஷன்ஸ்,
சென்னை.

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

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

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

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

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

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

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

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

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

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

TESTING AND EVALUATION

Course	Continuous Internal Assessment	Semester Examination
Hindi	25%	75%

Continuous Internal Assessment Component (CIA)

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

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA)

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

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

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

PASSING MINIMUM FOR EXTERNAL SEMESTER EXAMINATION -UG

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

PAPER I - PROSE, SHORT STORY AND GRAMMAR - I

Semester: I **Hours: 5**

Code : 23GH1GS01 **Credits: 3**

1. Prose : Naveen Hindi Patamala Part-3

Published by Dakshina Bharathi Hindi Prachar Sabha,

Thyagaraya Nagar, Chennai - 600 017.

The following Lessons have been prescribed

a) Shiraj Ki Gurubhakthi

b) Shri Krishn

c) Gupth Rupya

d) Karmaveer Kamaraj

2. Short Story : Kahani Manjari

Edited by: Dakshin Bharath Hindi Prachar Sabha,

Thyagaraya Nagar, Chennai - 600 017.

The following short stories have been priscribed

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

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

63, Tagore Nagarm Allahabad -2

The following topics have been prescribed

a) Noun b) Gender and Number

c) Pronoun d) Adjectives

COMMUNICATIVE ENGLISH - I

Semester: I **Hours: 4**

Code : 23GE1GS01 **Credit: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I **12 Hours**

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

UNIT II **12 Hours**

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

4. Study skills - II

   Using the internet as a resource

   a. Online search
   b. Know the keyword
   c. Refine your search
   d. Guidelines for using the Resources
   e. E- Learning resources of Government of India
   f. Terms to know

UNIT III **12 Hours**

1. Listening and Speaking
   a. Giving and following instructions
   b. Asking for and giving directions
   c. Continuing discussions with connecting ideas
2. Reading and writing
   a. Reading feature articles (from newspapers and magazines)
   b. Reading to identify point of view and perspective (opinion pieces, editorials etc.)
   c. Descriptive writing - writing a short descriptive essay of two to three paragraphs

UNIT IV **12 Hours**

1. Listening and Speaking
   a. Giving and responding to opinions
2. Reading and writing
   a. Note taking
   b. Narrative writing - writing narrative essays of two to three paragraphs

UNIT V **12 Hours**

1. Grammar in Context

   Naming and Describing
   a. Nouns and Pronouns
   b. Adjectives

   Involving Action- I
   a. Verbs
   b. Concord

   Involving Action- II
   a. Verbal- Gerund, Participle, Infinitive
   b. Modals

   Tense
   a. Present
   b. Past
   c. Future

COURSE BOOKS:

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

BOOKS FOR REFERENCE

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

WEB SOURCES

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

PROPERTIES OF MATTER AND SOUND

Semester: I **Hours: 6**

Code : 23PH1MC01 **Credit: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the elasticity of solid materials, viscosity and surface tension of fluids and concepts of ultrasonic waves and acoustics	PSO-1, PSO-2	K1
CO - 2	Summarize the moduli of elasticity, pheneomena associated with liquid liquid surfaces and importance of constructing buildings with good acoustics	PSO- 1, PSO-2	K2
CO - 3	Apply the concept of bending of beams, viscous force, liquid films,and simple harmonic motion for experimental study.	PSO- 3, PSO-4	K3
CO - 4	Explain the physics of elasticity, fluid films, different methods of producing ultrasonic waves and its applications	PSO-3, PSO- 4	K4
CO - 5	Evaluate the moduli of elasticity, co-efficient of viscosity, surface tension, frequency of strings and reverberation time.	PSO- 5	K5

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

Semester: I				**PROPERTIES OF MATTER AND SOUND**							**Hours: 6**
Code : 23PH1MC01											**Credit: 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	2	3	3	2	5	5	5	3	3	2	3.45
CO - 2	5	2	4	4	2	5	5	5	4	4	2	3.81
CO - 3	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 4	3	2	5	5	2	4	3	4	5	5	2	3.63
CO - 5	3	5	4	4	5	4	3	4	4	4	5	4.09
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: ELASTICITY

Elasticity -- Hooke's law - Elastic moduli - Poisson's ratio - Torsion of a body - Expression for couple per unit twist - static torsion method -Work done in twisting a wire - Torsional oscillations of a body - Rigidity modulus by dynamic torsion method (Torsional pendulum)- Beams - bending of beams - Expression for bending moment -Cantilever- Theory of uniform and non - uniform bending - Determination of young's modulus -Koenig's method. **(18 Hours)**

UNIT II: VISCOSITY

Viscosity - Co efficient of viscosity - Streamlined and turbulent motion - critical velocity - Rate of flow of liquid in a capillary tube - Poiseuille's formula -viscosity of highly viscous liquid-terminal velocity-stoke's method-Ostwald Viscometer-viscosity of gas-Rankine 's method. **(18 Hours)**

UNIT III: SURFACE TENSION

Surface tension - definition - Molecular forces - Explanation of surface tension on kinetic theory - Surface energy - work done in increasing the area of a surface - angle of contact- Excess pressure inside a curved liquid surface - Excess pressure inside a spherical and cylindrical drops and bubbles- experimental determination-Jaegar's method - variation of surface tension with temperature - Quincke's method-drop weight method. **(18 Hours)**

UNIT IV: SOUND

Simple Harmonic Motion -Composition of two S.H.M in a straight line-at right angles-Lissajous's figures - Free, Damped, Forced vibrations - Resonance -Laws of transverse vibration of strings - Sonometer-Determination of AC frequency using sonometer - Determination of frequency using Melde's apparatus- Decibels - Intensity levels - decibel-noise pollution. **(18 Hours)**

UNIT V: ULTRASONICS AND ACOUSTICS

Ultrasonics -Production - Piezoelectric crystal method - Magnetostriction method-Detection-Acoustics of building - Reverberation- Sabine's Reverberation formula (No derivation) - Factors affecting acoustics of building- Sound distribution in an auditorium- Requisites for good acoustics- Fourier theorem-application. **(18 Hours)**

BOOKS FOR STUDY:

1. Properties of matter, R. Murugeshan, Revised edition, S. Chand & Co, 2012.
2. A Text Book of Sound, N.Subrahmanyam and BrijLal, Second revised edition, Vikas Publishing House,1995.

DETAILED REFERENCE:

1. Properties of matter, R. Murugeshan, Revised edition, S. Chand & Co, 2012.

   UNIT-I: Chapter 1: 1.1, 1.2, 1.9 - 1.16, 1.19 - 1.21, 1.23

   UNIT-II: Chapter 2: 2.1-2.3, 2.5, 2.6, 2.8, 2.13, 2.14

   UNIT-III: Chapter 3: 3.1 -3.3, 3.6, 3.9, 3.11-3.13, 3.17

2. A Text Book of Sound, N.Subrahmanyam and BrijLal, Second revised edition, Vikas Publishing House,1995.

   UNIT-IV: Chapter 1: 1.1 -1.3

   Chapter 2: 2.1, 2.2, 2.4

   Chapter 3: 3.1- 3.5, 3.8

   Chapter 7: 7.3 -7.5, 7.16 - 7.23

   UNIT-V: Chapter 10: 10.14 - 10.16, 10.20 - 10.25, 10.28, 10.31, 10.32

BOOKS FOR REFERENCE:

1. Fundamentals of General Properties of Matter, H.R.Gulati, S. Chand & Co, 1982.
2. Fundamental of Physics, D. Hallidary,Resnick and J Walker, 6th Edition, Wiley, 2001.
3. Properties of matter, Brijlal and Subramanian S. Chand & Co, 2006.
4. Elements of properties of matter, D.S. Mathur, S. Chand & Co, 2004.

PHYSICS FOR EVERYDAY LIFE

Semester: I **Hours: 2**

Code : 23PH1MC02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire knowledge on various natural phenomena such as motion, electricity and light and the life history of few famous physicists.	PSO-1	K1
CO - 2	Explain mechanical, optical, electrical principles and the inventors	PSO-1, PSO-2	K2
CO - 3	Apply the principles of physics in day-to-day applications.	PSO-3	K3
CO - 4	Analyse the principles of mechanical, optical, electrical and solar energy across various devices	PSO-3, PSO-4	K4
CO - 5	Visualize the technology expected in near future.	PSO-1, PSO-5	K5

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

Semester: I						**# PHYSICS FOR EVERYDAY LIFE**					**Hours: 2**
Code : 23PH1MC02											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	3	2	3	5	2	3	3	3	5	3	2	3.09
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	3	4	3	2	2	5	3.36
Overall Mean Score												**3.29**

Result: The Score for this Course is **3.29** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: MECHANICAL OBJECTS

Spring scales - bouncing balls -roller coasters - bicycles -rockets and space travel.

(6 Hours)

UNIT II: OPTICAL INSTRUMENTS AND LASER

Vision corrective lenses - polaroid glasses - UV protective glass - polaroid camera - colour photography - holography and laser. **(6 Hours)**

UNIT III: PHYSICS OF HOME APPLIANCES

Bulb - fan - hair drier - television - air conditioners - microwave ovens - vacuum cleaners. **(6 Hours)**

UNIT IV: SOLAR ENERGY

Solar constant - General applications of solar energy - Solar water heaters - Solar Photo - voltaic cells - General applications of solar cells. **(6 Hours)**

UNIT V: INDIAN PHYSICIST AND THEIR CONTRIBUTIONS

C.V. Raman, Homi Jehangir Bhabha, Vikram Sarabhai, Subrahmanyan Chandrasekhar, Venkatraman Ramakrishnan, Dr. APJ Abdul Kalam and their contribution to science and technology. **(6 Hours)**

BOOK FOR STUDY:

- Course Material Prepared by the faculty of Department of Physics, Jayaraj Annapackiam College for Women (Autonomous), Periyakulam.

BOOKS FOR REFERENCE

1. The Physics in our Daily Lives, Umme Ammara, Gugucool Publishing, Hyderabad, 2019.
2. For the love of physics, Walter Lawin, Free Press, New York, 2011.

MAJOR PRACTICAL - I

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

Code : 23PH1CP01 & 23PH2CP01 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Define the different parameters of the given materials.	PSO-1	K1
CO-2	Determine the different parameters of the given materials using appropriate methods and equipments	PSO-2	K2
CO-3	Compare the obtained results with the theoretical value	PSO-2, PSO-3	K3
CO-4	Deduce the results from the required formulae	PSO-3, PSO-4	K4
CO-5	Assess the results.	PSO-4, PSO-5	K5

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

Semester : I & II							**MAJOR PRACTICAL I**					**Hours: 3+3**
Code : 23PH1CP01 & 23PH2CP01												**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	2	3	4	2	4	5	4	4	3	2	3.45
CO-2	4	2	4	4	2	5	4	5	4	4	2	3.63
CO-3	4	2	3	5	2	5	4	5	5	3	2	3.63
CO-4	4	2	5	5	2	4	4	4	5	5	2	3.81
CO-5	3	5	5	4	5	2	3	2	4	5	5	3.90
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

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 of the Prism.
11. Determination of frequency by Melde's String apparatus
12. Calibration of Ammeter using Potentiometer.
13. Determination of self-inductance of a coil by Owen's Bridge
14. Determination of co-efficient of Viscosity by Stoke's Method
15. Determination of frequency of AC mains using Sonometer.
16. Determination of self-inductance of a coil by De-Sauty's bridge
17. Determination of surface tension by capillary rise method.

ESSENTIAL MATHEMATICS - I

Semester: I **Hours: 5**

Code : 23MA1AC1A **Credit: 4**

COURSE OUTCOMES:

CO.NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Find the n^{th} derivative of a given function, and know the concept of double and triple integrals and central tendencies	PSO - 1	K1
CO - 2	Understand the concept of derivatives, integrals and measures of central tendencies	PSO - 4	K2
CO - 3	Apply the knowledge of derivatives, integrals and measures of central tendencies in real life scenario	PSO - 2	K3
CO - 4	Analyse the given function, series and the data	PSO - 3	K4
CO - 5	Evaluate the integrals and interpret the given statistical data	PSO - 5	K5

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

Semester: I				**ESSENTIAL MATHEMATICS - I**							**Hours: 5**
Code : 23MA1AC1A											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	4	3	3	3	3	5	3	3	3	4	3.54
CO - 2	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 3	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 4	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 5	3	5	3	3	3	3	3	3	3	3	5	3.36
Overall Mean Score												**3.40**

Result: The score for this course is **3.40** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

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 - Cosine and Sine series. **(15 Hours)**

UNIT IV

Central Tendencies: Introduction - Arithmetic mean - Partition values (Median, Quartiles, Deciles and Percentiles) - Mode - Geometric mean and Harmonic mean - Measures of dispersion. **(15 Hours)**

UNIT V

Moments - Skewness and Kurtosis - Curve fitting: Introduction - Principle of Least Squares - Fitting a straight line - Fitting a second degree parabola.

(15 Hours)

COURSE BOOK:

Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. S. Arumugam and A. Thangapandi Isaac, Ancillary Mathematics Paper I & III, New Gamma Publishing House, 1996 & 2002.
2. D. C. Sancheti and V. K. Kapoor, Statistics (Theory, Methods & Application), Century Printers, 2011.
3. D N Elhance, Veena Elhance and B. M. Aggarwal, Fundamentals of Statistics, seventh edition, Sultan Chand & Sons, 2009

E-RESOURCE:

1. https://www.classcentral.com/course/introduction-to-ordinary-differential-equations-p-92976

CALCULUS OF FINITE DIFFERENCES

Semester: I **Hours: 5**

Code : 23MA1AC1B **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire knowledge about algebraic and transcendental equations and the method of finite differences	PSO - 4	K1
CO - 2	Understand the methods of interpolation to solve the equations	PSO -2	K2
CO - 3	Apply the techniques of interpolation to solve a given problem	PSO - 3	K3
CO - 4	Analyse the given problem and identify the method to find approximate solutions	PSO - 1	K4
CO - 5	Appraise the techniques of interpolation in realistic situations	PSO - 5	K5

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

Semester: I				CALCULUS OF FINITE DIFFERENCES							Hours: 5
Code : 23MA1AC1B											Credit: 4
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 2	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 3	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 4	5	4	3	3	3	3	5	3	3	3	4	3.54
CO - 5	3	5	3	3	3	3	3	3	3	3	5	3.36
Overall Mean Score												3.40

Result: The score for this course is **3.40** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Algebraic and Transcendental equations - Introduction - Errors in numerical computation -Iteration method - Bisection method (Bolzano method) - Regular Falsi method - Newton - Raphson method. **(15 Hours)**

UNIT II

Simultaneous equations - Introduction - Simultaneous Equations - Backward substitution - Gauss Elimination Method - Gauss Jordan Elimination method.

(15 Hours)

UNIT III

Interpolation - Newton's Interpolation Formulae - Central Difference Interpolation formula - Gauss forward interpolation formula - Gauss Backward interpolation formula. **(15 Hours)**

UNIT IV

Sterling's formula - Bessel's formula - Laplace Everette's formula - Lagrange's Interpolation formula - Divided differences - Newton's divided difference formula - Inverse interpolation. **(15 Hours)**

UNIT V

Introduction - Derivatives using Newton's forward difference formula - Derivatives using Newton's backward difference formula - Derivatives using central difference formula. **(15 Hours)**

COURSE BOOK:

- Course material compiled by the Department.

BOOK OF REFERENCE:

1. S. Arumugam, A. Thangapandi Isaac and A. Somasundaram, Numerical Methods, SciTech Publications (India) Pvt. Ltd., Second Edition, 2010.

E-RESOURCE:

1. https://www.classcentral.com/course/introduction-to-ordinary-differential-equations-p-92976

ALLIED PHYSICS – I

MECHANICS, PROPERTIES OF MATTER AND THERMAL PHYSICS

Semester: I **Hours: 3**

Code : 23PH1AC1A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the fundamental laws of Mechanics, Properties of Matter and heat transfer.	PSO-1	K1
CO - 2	Explain the concepts of friction, bending of beams, Greenhouse effect, and Carnot's cycle.	PSO-1, PSO-2	K2
CO - 3	Apply the principles of mechanics, fluid motion and thermodynamics to solve the problems	PSO-3	K3
CO - 4	Examine the acquired knowledge through various experiments on elasticity, viscosity and heat	PSO-3, PSO-4	K4
CO - 5	Assess the importance of mechanics, properties of matter and thermal physics in real life situation.	PSO-1, PSO-5	K5

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

Semester: I				**ALLIED PHYSICS – I MECHANICS, PROPERTIES OF MATTER AND THERMAL PHYSICS**					**Hours: 3**		
Code : 23PH1AC1A										**Credit: 3**	
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	4	2	3	5	2	3	4	3	5	3	2	3.27
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	3	4	3	2	2	5	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: FORCE, WORK, POWER AND ENERGY

Newton's law of gravitation - Coulomb's law - Central Forces - Conservative Forces - Non-Conservative Forces - Friction - Limiting friction, Coefficient of Friction and Angle of Friction - Laws of Friction - Motion of bodies along an inclined plane - Work - Work done by a varying force - Energy - Kinetic Energy - Potential Energy - Power. **(9 Hours)**

UNIT II: ELASTICITY

Young's modulus - Rigidity modulus - Bulk modulus - Poisson's ratio (definition alone) - Bending of beams - Expression for bending moment - determination of young's modulus - uniform and non-uniform bending - Work done in Twisting - Torsional oscillation of a body - Rigidity modulus by torsion Pendulum. **(9 Hours)**

UNIT III: VISCOSITY

Viscosity -Derivation of Poiseuille's Formula - Poiseuille's method for determining coefficient of viscosity of a liquid - Equation of continuity - Bernoulli's Theorem - Applications of Bernoulli's Theorem - Pitot Tube. **(9 Hours)**

UNIT IV: CONDUCTION, CONVECTION AND RADIATION

Thermal conductivity - Lee's disc method of determining the thermal conductivity of a bad conductor- Thermal conductivity of air by Lee's disc method. Convection - Lapse rate. Radiation - Stefan's Law - Energy distribution in Black Body Spectrum- Statement of Planck's law of radiation - Wien's Law - Rayleigh-Jeans law. **(9 Hours)**

UNIT V: THERMODYNAMICS

Heat engine - Expression for the efficiency of a Carnot's engine - Carnot's theorem -Entropy - Change of entropy in a Carnot's cycle - Change of entropy in conversion of ice into steam. **(9 Hours)**

BOOKS FOR STUDY:

1. R. Murugeshan - Mechanics, Properties of Matter and Sound - Ist Edition Jun 2012 - Annai Print Park, Madurai.
2. R. Murugeshan - Thermal Physics - Ist Edition Sep. 2007-Vivekanada Press, Madurai.

DETAILED REFERENCE:

1. R. Murugeshan - Mechanics, Properties of Matter and Sound - Ist Edition Jun 2012 - Annai Print Park, Madurai.

   UNIT I : Chapter-1: All sections

   UNIT II : Chapter-4: 4.2 - 4.5, 4.7, 4.8, 4.11 - 4.13

   UNIT III : Chapter-5: 5.1 - 5.3, 5.5 - 5.7

2. R. Murugeshan - Thermal Physics - Ist Edition Sep. 2007-Vivekanada Press, Madurai.

   UNIT IV : Chapter-3: 3.1, 3.2, 3.5

   Chapter 4: 4.1- 4.3, 4.5

   UNIT V : Chapter-7: 7.1- 7.7

BOOKS FOR REFERENCE

1. Properties of Matter - Brijlal and Subramanyam - Eurasia Publishing co., New Delhi, III Edition 1983.
2. Elements of Properties of Matter - D.S.Mathur - S.Chand & Company Ltd, New Delhi, 10th Edition 1976.
3. Heat and Thermodynamics - Brijlal & Subramanyam, S.Chand & Co, 16th Edition 2005.

ALLIED PHYSICS – I
GRAVITATION, HEAT AND SOUND

Semester: I **Hours: 3**
Code : 23PH1AC1B **Credit: 3**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the fundamentals of gravitation, heat and sound.	PSO-1	K1
CO - 2	Explain the concepts of artificial satellites, thermal expansion of matter, thermodynamic processes, and various phenomena of fluid and simple oscillation.	PSO-1, PSO-2	K2
CO - 3	Apply the principles of compound pendulum, thermostat, superconductivity and stationary waves to solve the problems.	PSO-3	K3
CO - 4	Examine the acquired knowledge through various experiments on Boy's method, Regnault's method, porous plug and Lissajous figures.	PSO-3, PSO-4	K4
CO - 5	Assess the importance of gravitation, heat and sound in real life situation.	PSO-5	K5

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

Semester: I				**ALLIED PHYSICS – I GRAVITATION, HEAT AND SOUND**							**Hours: 3**
Code : 23PH1AC1B											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	3	2	3	5	2	3	3	3	5	3	2	3.09
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	3	4	3	2	2	5	3.36
Overall Mean Score												**3.29**

Result: The score for this course is **3.29** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: GRAVITATION

Kepler's law of planetary motion - Newton's Law of gravitation -Boy's method - Compound Pendulum-Expression for period -Experiment to find g -Variation of g with altitude, latitude and depth-Artificial satellites. **(9 Hours)**

UNIT II: THERMAL EXPANSION

Expansion of solids - Determination of the coefficient of linear expansion of a crystal -Expansion of anisotropic solids - Solids of low expansivity and their uses - Anomalous expansion of water - Thermostat. **(9 Hours)**

UNIT III: ISOTHERMAL AND ADIABATIC CHANGES

Isothermal change - Adiabatic change - Equation for the adiabatic change of a perfect gas - Two specific heat capacities of a gas - Difference between the two specific heat capacities - Joly's differential steam calorimeter for finding C_v - Regnault's method to find C_p **(9 Hours)**

UNIT IV: LOW TEMPERATURE PHYSICS

Joule - Kelvin effect - Porous plug experiment - Theory of Porous plug experiment - Adiabatic demagnetization - Superconductivity. **(9 Hours)**

UNIT V: SOUND

Simple harmonic oscillation - Composition of two simple harmonic motions in a straight line - Composition of two simple harmonic motions of equal time periods at right angles - Experimental method for obtaining Lissajous figures - Progressive waves - Stationary waves - Acoustic of buildings - Ultrasonics - Applications of ultrasonic waves. **(9 Hours)**

BOOKS FOR STUDY:

1. R. Murugeshan - Mechanics, Properties of Matter and Sound - Ist Edition Jun 2012 - Annai Print Park, Madurai.
2. R. Murugeshan - Thermal physics - Ist Edition Sep. 2007-Vivekanada Press, Madurai.

DETAILED REFERENCE:

1. R. Murugeshan - Mechanics, Properties of Matter and Sound - Ist Edition July 2016 - Annai Print Park, Madurai.

   UNIT I : Chapter-3: All sections

   UNIT V : Chapter-6: All sections
2. R. Murugeshan - Thermal physics - Ist Edition June 2012-Annai Print Park, Madurai.

   UNIT II : Chapter - 1 : All sections

   UNIT III : Chapter - 2 : All sections

   UNIT IV : Chapter-8: All sections

BOOKS FOR REFERENCE:

1. Mechanics - D.S. Mathur - S. Chand & Company Ltd, New Delhi, 1st Edition 1981
2. Properties of Matter and Acoustics - R. Murugesan and Er. Kiruthika Sivaprasath - S. Chand & Company Ltd, New Delhi, Revised Edition, 2012
3. Heat and Thermodynamics - D.S. Mathur, Sultan Chand & Sons, 5th Edition 2014.

ALLIED PHYSICS PRACTICAL-I

Semester: I **Hours: 2**

Code : 23PH1AP1A **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the required equipment and its purpose	PSO-1	K1
CO - 2	Explain the concepts of elasticity moduli, viscosity and sound	PSO-1, PSO-2	K2
CO - 3	Demonstrate the experiment through acquired knowledge	PSO-3	K3
CO - 4	Deduce the results from appropriate formula	PSO-3, PSO-4	K4
CO - 5	Assess the results with the standard values	PSO-5	K5

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

Semester: I				**ALLIED PHYSICS PRACTICAL - I**					**Hours: 2**		
Code: 23PH1AP1A											**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	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	3	2	3	5	2	3	3	3	5	3	2	3.09
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	3	4	3	2	2	5	3.36
Overall Mean Score												**3.29**

Result: The Score for this Course is **3.29** (High Relationship)

Note:

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

Values Scaling:

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

LISTOF PRACTICALS (Any Six)

1. Determination of Young's Modulus of the material of the beam by uniform bending method - Pin and Microscope.
2. Determination of Young's Modulus of the material of the bar by Non Uniform bending method - Optic Lever - Telescope and Scale method.
3. Determination of rigidity modulus of a wire using Torsion Pendulum.
4. Determination of "g" using Compound Pendulum.
5. Determination of co-efficient of viscosity of a highly viscous liquid- Stoke's Method.
6. Verification of laws of transverse vibrations of stretched strings by Sonometer.
7. Determination of surface tension of a liquid - Drop weight method.
8. Determination of surface tension of a liquid - Capillary rise method.

ALLIED PHYSICS PRACTICAL-I

Semester: I **Hours: 2**

Code : 23PH1AP1B **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the required equipment and its purpose	PSO-1	K1
CO - 2	Explain the concepts of gravitation, heat and sound	PSO-1, PSO-2	K2
CO - 3	Demonstrate the experiment through acquired knowledge	PSO-3	K3
CO - 4	Deduce the result from appropriate formula	PSO-3, PSO-4	K4
CO - 5	Assess the results with the standard values	PSO-5	K5

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

Semester: I				ALLIED PHYSICS PRACTICAL-I							Hours: 2
Code : 23PH1AP1B											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	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	3	2	3	5	2	3	3	3	5	3	2	3.09
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	3	4	3	2	2	5	3.36
Overall Mean Score												3.29

Result: The score for this course is **3.29** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any Six)

1. Determination of Young's Modulus of the material of the beam by uniform bending method - Optic lever- Telescope and Scale method.
2. Determination of Young's Modulus of the material of the bar by Non Uniform bending method - Pin and Microscope
3. Determination of thermal conductivity of a bad conductor - Lee's Disc Method.
4. Determination of the frequency of an electrically maintained tuning fork by Melde's string.
5. Calibrate the low range voltmeter using Potentiometer
6. Determination of the resistance of a given wire by comparing it with a known resistance
7. Compare the capacitances of two capacitors using a ballistic galvanometer.
8. Determination of resistance and resistivity of a wire using Ohm's law.

PROFESSIONAL ENGLISH

Semester: I **Hours: 2**

Code : 23AE1PE01 **Credit: 2**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

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

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

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

UNIT II: RECEPTIVE RESPONSE **6 Hours**

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

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

UNIT III: EASY EXPRESSIONS **6 Hours**

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

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

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

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

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

UNIT V: TELEPHONE SKILLS **6 Hours**

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

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

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

COURSE SOFTWARE:

Lady Hawk Software

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

INTRODUCTORY PHYSICS

Semester: I **Hours: 2**

Code : 23PH1FC01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the concept of physical quantities, forces, energy and types of motion and materials.	PSO-1	K1
CO - 2	Describe the behavior of objects and systems in nature.	PSO-2	K2
CO - 3	Apply physics concepts to analyze simple real-life situations and make predictions.	PSO-3	K3
CO - 4	Differentiate types of motions and materials.	PSO-3, PSO-4	K4
CO - 5	Relate various properties of matter with their behavior and connect them with different physical parameters involved.	PSO-4, PSO-5	K5

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

Semester: I			**# INTRODUCTORY PHYSICS**								**Hours: 2**
Code : 23PH1FC01											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	2	3	2	3	5	3	3	2	2	2.90
CO - 2	4	2	2	3	2	5	4	5	3	2	2	3.09
CO - 3	4	2	2	5	2	4	4	4	5	2	2	3.27
CO - 4	2	2	5	5	2	3	2	3	5	5	2	3.27
CO - 5	2	5	5	3	5	2	2	2	3	5	5	3.54
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: TYPES OF PHYSICAL QUANTITIES

Vectors, scalars -examples for scalars and vectors from physical quantities - addition, subtraction of vectors - resolution and resultant of vectors - units and dimensions- standard physics constants. **(6 Hours)**

UNIT II: TYPES OF FORCES

Different types of forces - gravitational, electrostatic, magnetic, electromagnetic, nuclear - mechanical forces like, centripetal, centrifugal, friction, tension, cohesive, adhesive forces. **(6 Hours)**

UNIT III: TYPES OF ENERGY

Different forms of energy - conservation laws of momentum, energy - types of collisions - angular momentum - alternate energy sources - real life examples. **(6 Hours)**

UNIT IV: TYPES OF MOTION

Types of motion- linear, projectile, circular, angular, simple harmonic motions - satellite motion - banking of a curved roads - stream line and turbulent motions - wave motion - comparison of light and sound waves - free, forced, damped oscillations. **(6 Hours)**

UNIT V: TYPES OF MATERIALS

Surface tension - shape of liquid drop - angle of contact - viscosity - lubricants - capillary flow - diffusion - real life examples - properties and types of materials in daily use - conductors, insulators - thermal and electric. **(6 Hours)**

BOOK FOR STUDY:

- Course Material Prepared by Dr. R. Mary Mathelane, Dr. A. Jacquiline Regina Mary, Dr. M. Arulmozhi, Dr. A. Jegatha Christy, Dr. D. Arockia Jency and Dr. A. Juliet Christina Mary, Department of Physics, Jayaraj Annapackiam College for Women (Autonomous), Periyakulam.

BOOKS FOR REFERENCE:

1. Elements of Properties of Matter, D.S.Mathur, S.Chand & Co, 2010.
2. Properties of Matter, BrijLal & N. Subrahmanyam, S.Chand & Co, 2003.
3. Fundamental of General Properties of Matter, H.R. Gulati, Fifth edition, S.Chand & Co. 1977.

PART - V - STUDENT TRAINING PROGRAMME

NATIONAL SERVICE SCHEME

U. G. PROGRAMME OUTCOMES

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

U. G. PROGRAMME SPECIFIC OUTCOMES

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

NATIONAL SERVICE SCHEME

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

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

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I: BASICS OF NSS

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

UNIT II: PERSONALITY DEVELOPMENT

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

UNIT III: SOCIAL SERVICE

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

UNIT IV: NUTRITIOUS FOOD AND WOMEN'S HEALTH

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

UNIT V: ECOLOGY AND ROLE OF WOMEN IN SOCIETY

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

COURSE BOOK:

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

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

QUESTION PATTERN

NATIONAL SERVICE SCHEME-23STPNS01

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

Date: **Max.: 30 Marks**

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

NATIONAL CADET CORPS

U.G. PROGRAMME OUTCOMES (2023 - 2026)

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

PROGRAM SPECIFIC OUTCOMES (PSO)

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

NATIONAL CADET CORPS

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

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

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I: ARMED FORCES AND MILITARY HISTORY

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

UNIT II: MAP READING, FCBC AND WEAPON TRAINING

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

UNIT III: DISASTER MANAGEMENT AND CIVIL AFFAIRS

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

UNIT IV: NATIONAL INTEGRATION AND SOCIAL AWARENESS

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

UNIT V: PERSONALITY DEVELOPMENT, LEADERSHIP AND FIRST AID

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

BOOK FOR REERENCE:

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

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

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

Question Pattern for Summative Examination

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

Section - A

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

Section - B

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

Section - C

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

PHYSICAL EDUCATION (2023-2026)

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

YOGA AND PHYSICAL WELLNESS

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

Code : 23STPPE01

COURSE OUTCOMES

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

UNIT I: ASANAS **(24 hours)**

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

UNIT II: PRANAYAMA **(24 hours)**

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

UNIT III: SURYANAMASKAR **(24 hours)**

Meaning - Benefits - Steps - Poses (12 posture)

UNIT IV: NUTRITION **(24 hours)**

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

UNIT V: FIRST AID **(24 hours)**

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

BOOKS FOR REFERENCE:

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

SCHEME OF EVALUATION

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

SCHEME OF EVALUATION FOR COTINUOUS INTERNAL ASSESSMENT

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

QUESTION PATTERN FOR SUMMATIVE EXAMINATION

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

SECTION - A

Answer All Questions (5x1=5)

(Choose the best Answer)

SECTION - B

Answer any two questions (2x2=4)

(Four question out of four)

SECTION - C

Answer any Two out of Four questions

(2x5=10)

(Four question out of Four)

SECTION - D

Answer any one question (1x6=6)

(One question out of two)

CONSUMER CLUB

PROGRAMME OUTCOMES:

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

PROGRAMME SPECIFIC OUTCOMES:

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

CONSUMER CLUB

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

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

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

Field Visit.

COURSE BOOKS:

- Material prepared by the Consumer Club

BOOK FOR REFERENCE:

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

E-RESOURCES:

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

SCHEME OF EVALUATION

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

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

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

INTERNAL TEST (THEORY)

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

Section - A

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

Section - B

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

Section - C

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

RED RIBBON CLUB

PROGRAMME OUTCOMES

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

PROGRAMME SPECIFIC OUTCOMES:

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

RED RIBBON CLUB

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

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

COURSE OUTCOMES

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

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

COURSE BOOK:

- Book offered by Red Ribbon Club Committee Members

BOOKS FOR REFERENCE

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

SCHEME OF EVALUATION

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

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

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

Question Pattern for Internal Examination

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

Section - A

Answer All Questions 5 x 1= 5 Marks

(Multiple Choice Questions)

Section - B

Answer All Questions 2 x 5= 10 Marks

(Either or Questions)

Section - C

Answer Any One Question 1 x 10 =10 Marks

(One Question Out of Three)

YOUTH RED CROSS

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

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

PROGRAMME OUTCOMES:

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

PROGRAMME SPECIFIC OUTCOMES

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

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

BASICS OF YOUTH RED CROSS

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

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

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

Volunteering - Trainings

COURSE BOOK:

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

BOOKS FOR REFERENCE:

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

YOUTH RED CROSS

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

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

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

Youth Red Cross - Junior Red Cross

UNIT V

Field Visit

COURSE BOOK:

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

BOOKS FOR REFERENCE:

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

SCHEME OF EVALUATION

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

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

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

Question Pattern for Internal Examination

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

Section - A

Answer All Questions 5 x 1= 5 Marks

(Multiple Choice Questions)

Section - B

Answer All Questions 2 x 5= 10 Marks

(Either or Questions)

Section - C

Answer Any One Question 1 x 10 =10 Marks

(One Question Out of Three)

பொதுத்தமிழ் - 2

(பிறதுறை மாணவிகளுக்கு மட்டும்)

பருவம்: இரண்டு **நேரம்: 6**

குறியீடு: 23GT2GS02 **புள்ளி: 3**

COURSE OUTCOMES:

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

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

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

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

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

Note:

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

Values Scaling:

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

அலகு 1

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

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

அலகு 2

வள்ளலார்-அருள் விளக்கமாலை (முதல் 10பாடல்கள்)

எச்.ஏ.கிருட்டிணப்பிள்ளை - இரட்சணியமனோகரம் - பால்ய பிராத்தனை

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

அலகு 3

தமிழ்விடு தூது - (முதல் 20 கண்ணி)

திருக்குற்றாலக் குறவஞ்சி-குறத்தி மலைவளம் கூறுதல்

முக்கூடற்பள்ளு-நாட்டுவளம் **18 Hours**

அலகு4

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

அலகு 5: மொழித்திறன் / போட்டித் தேர்வுத் திறன்

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

(குறிப்பு: அலகு4, 5ஆகியனபோட்டித் தேர்வுநோக்கில் நடத்தப்படவேண்டும்)

பாடநூல்கள்

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

பார்வை நூல்கள்

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

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

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

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

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

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

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

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

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

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

NOVEL, ONE ACT PLAY AND GRAMMAR

Semester: II **Hours:5**

Code : 23GH2GS02 **Credit:3**

COURSE OUTCOMES:

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

UNIT I **(15 Hours)**

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

UNIT II **(15 Hours)**

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

UNIT III **(15 Hours)**

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

UNIT IV **(15 Hours)**

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

UNIT V **(15 Hours)**

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

COURSE BOOKS:

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

   The following Ekankies have been prescribed

   a) Rajpoothri Ka badla – Divjendralal Rai

   b) Andher Nagaree - Bharathendu Harichandra

   c) Reed Kee Haddi – Jagadeeshachandra Maathur

   d) Bahu kee Vidha – Shri vinodh Rasthogi

BOOK FOR REFERENCE:

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

   The following topics have been prescribed

   a) Verb
   b) Tense and Voice
   c) Adverb
   d) Prepositions
   e) Conjunctions
   f) Interjunctions

COMMUNICATIVE ENGLISH – II

Semester: II **Hours: 4**

Code : 23GE2GS02 **Credit: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I **12 Hours**

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

UNIT II **12 Hours**

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

UNIT III **12 Hours**

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

UNIT IV **12 Hours**

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

UNIT V **12 Hours**

Grammar in Context

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

COURSE BOOKS:

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

BOOKS FOR REFERENCE

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

WEB RESOURCES

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

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

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

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

HEAT AND THERMODYNAMICS

Semester: II **Hours: 4**

Code : 23PH2MC03 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the laws of thermodynamics and the behavior of ideal gases	PSO -1	K1
CO - 2	Illustrate the various transport phenomena and thermodynamic systems	PSO - 2	K2
CO - 3	Apply thermodynamical principles to heat engine	PSO - 3	K3
CO - 4	Analyze the laws of thermodynamics to heat engines and transport phenomena of gases	PSO -4	K4
CO - 5	Evaluate entropy changes for various thermodynamic systems and thermodynamical relations	PSO - 5	K5

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

Semester: II				**HEAT AND THERMODYNAMICS**							**Hours: 4**
Code : 23PH2MC03											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	2	3	3	5	3	2	4	3	3.36
CO - 2	2	3	3	4	3	5	2	5	4	3	3	3.36
CO - 3	3	2	3	5	2	4	3	4	5	3	2	3.28
CO - 4	2	4	5	2	4	3	2	3	2	5	4	3.28
CO - 5	2	5	2	3	5	4	2	4	3	2	5	3.36
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: 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. **(12 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. **(12 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. **(12 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. **(12 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. **(12 Hours)**

BOOK FOR STUDY:

- Heat, Thermodynamics and Statistical Physics, Brijlal N. Subrahmanyam and P. S. Hemne, S. Chand & Co, 2014.

DETAILED REFERENCE:

- Heat, Thermodynamics and Statistical Physics, Brijlal N. Subrahmanyam and P. S. Hemne, S. Chand & Co, 2014.

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

ELECTRICITY AND ELECTROMAGNETISM

Semester: II **Hours: 4**

Code : 23PH2MC04 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the fundamental laws of electricity and electromagnetism	PSO - 1	K1
CO - 2	Illustrate the concepts of electrostatics, magnetism, and various network theorems	PSO - 3	K2
CO - 3	Explain the laws and theorems used in electricity, magnetism and different bridge circuits respectively	PSO - 4	K3
CO - 4	Examine the working of capacitors, inductors, various bridges and networksand properties of magnetic materials	PSO - 2	K4
CO - 5	Imbibe the concepts of electricity and electro-magnetism through acquired knowledge and practical learning	PSO - 5	K5

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

Semester: II				**ELECTRICITY AND ELECTROMAGNETISM**							**Hours: 4**
Code : 23PH2MC04											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	3	2	3	3	5	3	2	3	3	3.18
CO - 2	3	3	2	5	3	3	3	3	5	2	3	3.18
CO - 3	4	3	5	3	3	2	4	2	3	5	3	3.36
CO - 4	2	3	3	3	3	5	2	5	3	3	3	3.18
CO - 5	3	5	4	2	5	2	3	2	2	4	5	3.36
Overall Mean Score												**3.25**

Result: The score for this course is **3.25**(High relationship)

Note:

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

Values Scaling:

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

UNIT I: ELECTROSTATICS

Coulomb's law - Superposition principle - Electric field - Point charge - Flux of the Electric field - Gauss's law - Potential difference - Capacitors: Principle of Capacitor - Capacitance of a Spherical Capacitor - Capacitance of a Cylindrical Capacitor - Capacitance of a Parallel Plate Capacitor - Effect of a dielectric - Capacitance of a Parallel Plate Capacitor partly filled with a Dielectric Slab - Capacitors in Series and Parallel - Energy stored in a charged capacitor - Loss of energy on sharing of charges between two capacitors - Force of attraction - Types of capacitors.

(12 Hours)

UNIT II: MAGNETIC EFFECTS OF ELECTRIC CURRENT

Ohm's law - Kirchhoff's laws - Carey-Foster bridge - Temperature co-efficient of resistance - Potentiometer - Calibration of Ammeter, Voltmeter (Low and High range) - Magnetic induction - Biot-Savart law - Torque on a current loop in a uniform magnetic field - Ballistic Galvanometer - Current and Voltage sensitiveness - Measurement of Charge sensitiveness - Absolute capacitance of a capacitor - Comparison of two capacitances using B.G. - Comparison of emf's of two cells using B.G. **(12 Hours)**

UNIT III: ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENT

Electromagnetic induction: Faraday's laws - Self-induction - Self-inductance of a long solenoid - Self-inductance by Anderson's bridge method - Mutual induction - Mutual inductance between two co-axial solenoids - Experimental determination of mutual inductance - Co-efficient of coupling - Eddy currents. Alternating current: Emf induced in a coil rotating in a magnetic field - Series resonance circuit - Parallel resonant circuit. **(12 Hours)**

UNIT IV: MAGNETIC PROPERTIES OF MATERIALS

Magnetic induction - Magnetisation - Relation between the three magnetic vectors B, H and M - Magnetic susceptibility - Magnetic permeability - Properties of dia, para and ferromagnetic materials - Antiferro and Ferrimagnetism - Electron theory of dia, para and ferromagnetism - Langevin's theory of diamagnetism - Langevin's theory of paramagnetism - Weiss's theory of ferromagnetism - Experiment to draw M-H curve - Energy loss due to hysteresis. **(12 Hours)**

UNIT V: NETWORK THEOREMS AND AC BRIDGES

Network theorems: Superposition theorem - Reciprocity theorem - Thevenin's theorem - Norton's theorem - Maximum Power Transfer Theorem. AC Bridges: Maxwell's bridge - Owen's bridge - De-Sauty's bridge - Wein's bridge - Schering's bridge. **(12 Hours)**

BOOK FOR STUDY:

- Electricity and Magnetism, R. Murugesan, S. Chand & Company Pvt. Ltd, New Delhi, 2016.

DETAILED REFERENCE:

- Electricity and Magnetism, R. Murugesan, S. Chand & Company Pvt. Ltd, New Delhi, 2016.

UNIT I: Chapter 1 - 1.1 to 1.5; Chapter 2 - 2.1, 2.2;
Chapter 3: 3.1 to 3.3; Chapter 4 - 4.1 to 4.9, 4.11 to 4.13

UNIT II: Chapter 6: 6.4, 6.6; Chapter 7: 7.1, 7.2; Chapter 10: 10.1, 10.2, 10.10 to 10.16

UNIT III: Chapter 11: 11.1 to 11.4, 11.6 to 11.10, 11.16; Chapter 13: 13.1 to 13.3

UNIT IV: Chapter 15: 15.1 to 15.14, 15.16

UNIT V: Chapter 18: 18.1 to 18.6; Chapter 19: 19.1 to 19.6

BOOKS FOR REFERENCE:

1. Electricity and Magnetism, Sathya Prakash, Pragati Prakashan edition, Meerut, Twenty seventh edition, 2012.
2. Electricity and Magnetism, Brijlal and Subramanyam - S. Chand & Company Pvt. Ltd, New Delhi, 2005.
3. Foundations of Electricity and Magnetism, Basudev Ghosh, Books and Allied (P) Ltd., Kolkata, 2012.

ALLIED PHYSICS - II

ELECTRICITY, ELECTRONICS AND ATOMIC PHYSICS

Semester: II **Hours: 3**

Code : 23PH2AC2A **Credits: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the laws of electricity, electromagnetism, electronics and atomic physics	PSO - 1	K1
CO - 2	Explain the concepts of electricity, magnetism, semiconductor devices, atomic and nuclear physics	PSO - 2	K2
CO - 3	Apply the acquired knowledge through various experiments and models	PSO - 3	K3
CO - 4	Examine the basic principles with the corresponding concepts in interdisciplinary science	PSO - 4	K4
CO - 5	Assess the importance of electricity, electronics and atomic physics in real life situation.	PSO - 5	K5

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

Semester: II				ALLIED PHYSICS - II ELECTRICITY, ELECTRONICS AND ATOMIC PHYSICS						Hours: 3	
Code : 23PH2AC2A										Credit: 3	
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	3	4	2	3	3	5	3	2	4	3	3.36
CO - 2	2	3	3	4	3	5	2	5	4	3	3	3.36
CO - 3	3	3	3	5	3	4	3	4	5	3	3	3.55
CO - 4	2	4	5	2	4	3	2	3	2	5	4	3.27
CO - 5	2	5	2	2	5	4	2	4	2	2	5	3.18
Overall Mean Score												3.34

Result: The score for this course is **3.34** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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: CURRENT ELECTRICITY

Kirchhoff's laws - Wheatstone's network- Carey-Foster's bridge - measurement of resistance - determination of temperature coefficient of resistance - Potentiometer - calibration of ammeter - calibration of Voltmeter. **(9 Hours)**

UNIT II: ELECTROMAGNETISM

Electromagnetic Induction - Faraday's laws of Electromagnetic Induction - Self Induction -Mutual Induction. - Mean value of alternating current - RMS value of alternating current - A.C. Circuits - LCR in series circuit. **(9 Hours)**

UNIT III: ATOMIC AND NUCLEAR PHYSICS

Bohr's atom model - Atomic excitation - Critical potential - Experimental determination of Critical potential (Frank and Hertz Method only). Nuclear properties - Size, mass, density, charge and spin angular momentum - Binding energy - Nuclear fusion and Nuclear fission. **(9 Hours)**

UNIT IV: ANALOG ELECTRONICS

Formation of PN junction diode, Biasing, V-I characteristics - Zener diode - Characteristics of Zener diode - Bridge rectifier -Transistor - Working of an n-p-n transistor - CE Configuration -Characteristics of a Transistor (CE mode) - Common Emitter Transistor amplifier -Hartley oscillator - Positive feedback. **(9 Hours)**

UNIT V: DIGITAL ELECTRONICS

Decimal Number system - Binary Number system - Conversion of binary number into decimal number - Conversion of decimal number into binary number - Binary addition and subtraction. Boolean's algebra - Postulates and theorems of Boolean Algebra -De Morgan's theorems - Logic gates - NOT Gate (Inverter) - OR Gate - AND Gate, NOR Gate- NOR gate is a universal gate - NAND gate is a universal gate - Exclusive OR Gate. **(9 Hours)**

COURSE BOOKS:

1. R. Murugeshan - Electricity and Electronics, I Edition, Annai Print Park, Madurai, 2016.

UNIT I: Chapter - 2 All sections

UNIT II: Chapter - 3 (B): 3.12, 3.13

UNIT IV: Chapter - 4: 4.1- 4.5, 4.7, 4.9 - 4.12, 4.14,4.15.

UNIT V: Chapter - 5 (All sections)

2. R. Murugesan - Electricity and Magnetism, S. Chand & Co, 2001

UNIT II: Chapter-11: 11.1,11.3,11.7

3. R. Murugeshan - Modern Physics, 18th Edition, S. Chand & Co, New Delhi, 2016.

UNIT III: Chapter - 4: 4.3, 4.7 - 4.9
Chapter - 17: 17.3, 17.4
Chapter - 22: 22.1, 22.6

BOOKS FOR REFERENCE

1. V.K. Mehta - Principle of Electronics, 7th Revised Edition, S. Chand & Co, New Delhi, 2014.
2. S.B. Patel - Nuclear Physics an Introduction, 3rd Edition, New International Publishers, 2021.
3. B.L. Theraja, Basic Electronics, S. Chand & Co, 2003.

ALLIED PHYSICS - II

OPTICS, SPECTROSCOPY AND MODERN PHYSICS

Semester: II **Hours: 3**

Code : 23PH2AC2B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the fundamentals of optics, spectroscopy and modern physics.	PSO - 1	K1
CO - 2	Summarize the concepts of geometrical optics, interaction of light with matter and relativistic approach.	PSO - 4	K2
CO - 3	Solve the problems on optics, spectroscopy and modern physics through the acquired knowledge.	PSO - 2	K3
CO - 4	Differentiate the nature of light in geometrical optics and interaction with an obstacle.Illustrate the postulates of special theory of relativity	PSO - 3	K4
CO - 5	Assess the nature of light in various medium and the relativistic phenomena in different coordinates	PSO - 5	K5

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

Semester: II				**ALLIED PHYSICS - II OPTICS, SPECTROSCOPY AND MODERN PHYSICS**							**Hours: 3**
Code : 23PH2AC2B											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	3	3	2	5	2	3	4	3	3.36
CO - 2	4	3	5	2	3	3	4	3	2	5	3	3.36
CO - 3	2	3	3	3	3	5	2	5	3	3	3	3.18
CO - 4	2	3	4	5	3	3	2	3	5	4	3	3.36
CO - 5	3	5	2	2	5	4	3	4	2	2	5	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 : GEOMETRICAL OPTICS

Deviation produced by thin lens - Focal length of two thin lenses in contact - Definition of Cardinal points and Respective planes - Refraction through a thin prism - Dispersion through the prism - Dispersive power - Dispersion without deviation - - Aplanatic Lens - Oil immersion objective - Rainbow - Theory of primary rainbow - Secondary rainbow. **(9 Hours)**

UNIT II: INTERFERNCE AND DIFFRACTION

Interference - Interferencin thin films - Production of colors in thin films - Air wedge - Newton's ring - Determination of wavelength - Jamin's Interferometer, Principle and use. Diffraction - Plane transmission grating (Normal incidence only) - Experiment to determine wavelengths. **(9 Hours)**

UNIT III: POLARIZATION AND FIBER OPTICS

Polarization of light - Double refraction -Huygen's theory of double refraction in uniaxial crystals - Nicol prisms - QWP and HWP - Optical activity (No theory) - Biot's laws for rotatory polarization - Specific rotatory power - Half shade polarimeter. **(9 Hours)**

UNIT IV : SPECTROSCOPY, QUANTUM THEORY AND PHOTOECLECTRICITY

Infrared spectroscopy - Ultraviolet spectroscopy spectroscopy - Planck;s quantum theory- Raman effect - Experimental study - Characteristics of Raman lines - Quantum theory of Raman effect - Applications . Photoelectricity - Experimental investigation on the Photoelectric effect - Laws of Photoelectric emission - Einstein's Photoelectric equation -Photoelectric cells - Applications. **(9 Hours)**

UNIT V: WAVE NATURE OF MATTER AND RELATIVITY

Wave nature of matter - De- Broglie wavelength - Electron diffraction - G.P.Thomson's experiment - Michelson Moreley experiment - Postulates of special theory of relativity - Length contraction - Time dilation - Variation of mass with velocity - Mass Energy equivalence. **(9 Hours)**

BOOK FOR STUDY

- Optics Spectroscopy and Modern Physics - R. Murugeshan, 2016-Annai Print Park, Madurai.

DETAILED REFERENCE:

UNIT I: Chapter 1: (All section)

UNIT II: Chapter 2: (All section)

UNIT III: Chapter 3: 3.1 - 3.10

UNIT IV: Chapter 4 (All section)

UNIT V: Chapter 5 (All section)

BOOK FOR REFERENCE

1. Optics and Spectroscopy -R.Murugeshan, S.Chand and co., New Delhi, 6th Edition, 2008.
2. A text book of Optics - Subramanyam and Brijlal, S. Chand, New Delhi, 22nd Edition, 2004.
3. Optics - Sathyaprakash, Ratan Prakashan Mandhir, New Delhi, VIIth Edition, 1990.

ALLIED PHYSICS PRACTICAL - II

Semester: II **Hours: 2**

Code : 23PH2AP2A **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the integrated circuits and components	PSO - 1	K1
CO - 2	Explain the purpose of ICs and components	PSO - 2	K2
CO - 3	Construct the logic gates using appropriate ICs	PSO - 3	K3
CO - 4	Examine the results with truth tables	PSO - 4	K4
CO - 5	Assess the results	PSO - 5	K5

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

Semester: II							**ALLIED PHYSICS PRACTICAL -II**					**Hours: 2**
Code : 23PH2AP2A												**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	3	3	3	2	5	2	3	3	3	3.18
CO - 2	3	2	4	2	2	5	3	5	2	4	2	3.36
CO - 3	2	3	3	5	3	3	2	3	5	3	3	3.18
CO - 4	3	2	5	4	2	3	3	3	4	5	2	3.27
CO - 5	3	5	4	2	5	2	3	2	2	4	5	3.36
Overall Mean Score												**3.27**

Result: The Score for this Course is **3.27** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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 Six)

1. Construction of AND, OR, NOT - Using discrete components.
2. Construction of AND, OR, NOT - Using IC 74 Series.
3. Construction of NAND, NOR - Using IC.
4. Verification of Booleans laws.
5. Construction of AND, OR, NOT gates using universal Gates.
6. To study the characteristics of Zener Diode
7. Verification of De - Morgan's theorems.
8. Construction and verification of Half adder and Half Subtractor.

ALLIED PHYSICS PRACTICAL - II

Semester: II **Hours: 2**

Code : 23PH2AP2B **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the required equipment and its purpose	PSO - 1	K1
CO - 2	Explain the working of the equipment.	PSO - 2	K2
CO - 3	Focus and demonstrate the experiment through acquired knowledge	PSO - 3	K3
CO - 4	Deduce the result from appropriate formula	PSO - 4	K4
CO - 5	Assess the result	PSO - 5	K5

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

Semester: II				**ALLIED PHYSICS PRACTICAL - II**							**Hours: 2**
Code : 23PH2AP2B											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	3	3	3	2	5	2	3	3	3	3.18
CO - 2	3	2	4	2	2	5	3	5	2	4	2	3.36
CO - 3	2	3	3	5	3	3	2	3	5	3	3	3.18
CO - 4	3	2	5	4	2	3	3	3	4	5	2	3.27
CO - 5	3	5	4	2	5	2	3	2	2	4	5	3.36
Overall Mean Score												**3.27**

Result: The Score for this Course is **3.27** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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 Six)

1. Air wedge - Thickness of insulation
2. Refractive index of a solid prism using Spectrometer
3. Dispersive power of a prism - Spectrometer
4. Spectrometer - Grating - Wavelength of the Spectrum
5. Newton's Rings - Determination of radius of curvature
6. Mirror galvanometer - Voltage and current sensitiveness
7. LCR - Series Resonance
8. LCR - Parallel Resonance

ESSENTIAL MATHEMATICS - II

Semester: II **Hours: 5**

Code : 23MA2AC2A **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire knowledge of differential equations and operators	PSO - 1	K1
CO - 2	Understand the calculus of vector functions	PSO - 2	K2
CO - 3	Articulate expansions of trigonometric functions	PSO - 3	K3
CO - 4	Connect vector differentiation with the concepts of gradient, divergence, and curl concepts	PSO - 5	K4
CO - 5	Evaluate line and surface integrals	PSO - 4	K5

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

Semester: II				**ESSENTIAL MATHEMATICS - II**					**Hours: 5**		
Code : 23MA2AC2A									**Credit: 4**		
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	4	3	3	3	3	5	3	3	3	4	3.55
CO - 2	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 3	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 4	3	5	3	3	2	3	3	3	3	3	5	3.36
CO - 5	2	3	3	3	5	5	2	3	3	5	3	3.36
Overall Mean Score												**3.40**

Result: The score for this course is **3.40** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

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

UNIT II

Vector differentiation - Vector differential operator - Gradient - Directional derivative -Divergence and curl - Solenoidal and irrotational vectors.

(15 Hours)

UNIT III

Vector integration - Line integrals - Surface integrals - Theorems of Green, Gauss and Stokes (problems only). **(15 Hours)**

UNIT IV

Expansion of sin nθ, cos nθ, and tan nθ - Formation of Equations. **(15 Hours)**

UNIT V

Powers of sines and cosines of θ in terms of functions of multiples of θ - Expansions of sin θ, cos θ, tan θ in a series of ascending powers of θ.

(15 Hours)

COURSE BOOK:

- Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. S. Arumugam and A. Thangapandi Issac , Ancillary Mathematics Paper II & III, New Gamma Publishing House, 1996 & 1997.
2. S. Narayanan & T. K. Manicavachagom Pillay, Trigonometry, S. Viswanathan (Printers & Publishers) Pvt. Ltd., 2008.
3. A. Abdul Rasheed, Allied Mathematics I, Vol. I, Vijay Nicole Imprints Pvt. Ltd.,2005.

E-RESOURCES:

1. https://www.khanacademy.org/math/trigonometry
2. https://youtu.be/94UNkDQ-aUM
3. https://youtu.be/AKN2AMcptO0

CLASSICAL ALGEBRA

Semester: II **Hours: 5**

Code : 23MA2AC2B **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire knowledge on the theory of equations	PSO - 4	K1
CO - 2	Understand the concepts theory of equations and the methods of interpolation to solve the equations	PSO -2	K2
CO - 3	Apply the techniques of summation of series and interpolation to solve a given problem	PSO - 3	K3
CO - 4	Analyse the given problem and identify the method to find solutions	PSO - 1	K4
CO - 5	Appraise the techniques of interpolation and series expansion in realistic situations	PSO - 5	K5

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

Semester: II				**CLASSICAL ALGEBRA**							**Hours: 5**
Code : 23MA2AC2B											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	2	3	2	3	5	5	2	3	3	5	3	3.36
CO - 2	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 3	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 4	5	4	3	3	3	3	5	3	3	3	4	3.55
CO - 5	3	5	3	3	3	3	3	3	3	3	5	3.36
Overall Mean Score												**3.40**

Result: The score for this course is **3.40** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Theory of Equations: Remainder theorem - Fundamental theorem of Algebra - Relation between roots and coefficients - Symmetric function of the roots - Sum of the powers of the roots of an equation - Newton's Theorem on a sum of powers of roots. **(15 Hours)**

UNIT II

Transformation of Equations: Reciprocal roots - Reciprocal equations - To increase or decrease the roots of a given equation by a given quantity.

(15 Hours)

UNIT III

Integral roots: Numerical solution by Horner's method and Newton's Method **(15 Hours)**

UNIT IV

Binomial theorem for a rational index - particular cases of Binomial expansion - Greatest term - application of the binomial theorem to the summation of series. **(15 Hours)**

UNIT V

Logarithmic and Exponential series: Exponential limit - Summation of series - Logarithmic series. **(15 Hours)**

COURSE BOOK:

- Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. A. Abdul Rasheed, Allied Mathematics I, Vol. I, Vijay Nicole Imprints Pvt. Ltd.,2005.
2. T. K. Manicavachagom Pillay, T. Natarajan, and K. S. Ganapathy, Algebra , Volume I, Ananda Book Depot, 2016.

E-RESOURCES:

1. https://youtu.be/5nNPf_EB7Es
2. https://youtu.be/zCVtqFy33Kw

ABILITY ENHANCEMENT COURSE (AEC -2)

SUSTAINABILITY LIFE SKILLS

PROGRAMME OUTCOMES

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

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Develop positive thinking that helps them to set and pursue for meaningful goals.	PO-1, 6
2.	Inculcate 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.	Create a consciousness about Sustainable Development goals which is aimed to ensure dignity, peace and prosperity for people and the planet, now and in the future.	PO-3,6
4.	Acquiring trade skills by developing social relationships effectively with trade experts.	PO-2,5,6
5.	Create a consciousness about Sustainable Development goals which is aimed to ensure dignity, peace and prosperity for people and the planet, now and in the future.	PO-3,6

SUSTAINABILITY LIFE SKILLS

Semester: II **Hours: 2**

Code : 23AE2VE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	To make them realise the importance of physical health, emotional well-being, and stressmanagement.	PSO-1	K1
CO - 2	Apply the features of team work and strive to become good leaders.	PSO-2,4	K2
CO - 3	Enhance their awareness on social media and e- learning.	PSO-3	K3
CO - 4	Develop interactive skills in online trade, and become value based professionals.	PSO-4	K4
CO - 5	Imbibe awareness about Sustainable Development Goals and become better citizen of the world.	PSO-5	K5

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

Semester: II				**SUSTAINABILITY LIFE SKILLS**							**Hours: 2**
Code : 23AE2VE02											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	4	4	4	3	4	4	3	4	4	3.88
CO - 2	4	4	3	4	4	3	4	4	4	4	4	3.81
CO - 3	4	3	4	4	4	3	4	4	4	4	4	3.81
CO - 4	4	4	4	4	4	3	4	4	3	4	3	3.72
CO - 5	4	4	3	4	4	3	3	4	4	4	4	3.72
Overall Mean Score												**3.78**

Result: The score for this course is **3.78** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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 **6 Hours**

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

UNIT II **6 Hours**

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

UNIT III **6 Hours**

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

UNIT IV **6 Hours**

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

UNIT V **6 Hours**

Sustainable Development Goals.

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

COURSE TEXT:

- Prepared by the members of Foundation Course.

BOOKS FOR REFERENCE:

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

WEB-SOURCES

https://www.skillsyouneed.com/rhubarb/core-life-skills.html

http://www.linkedin.com/pulse/what-makes-positive-attitude-10-components-gary

http://ifflab.org/how-to-prevent-cyber-bullying-anti-cyber-bullying-law- in- india/

http://www.sciencedaily .com/terms/morphing.htm#:text=Morphing%20is%special %effect,little%20 instruction%20 from%20the %20 user.

https://apps.gov.in/apps

https://sdgs.un.org/goals

https://www.indeed.com/career-advice/career-development/entrepreneurial-skills

EFFECTIVE ENGLISH

Semester: II **Hours: 2**

Code : 23SE2CE02 **Credit: 2**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I: Easy Enacting **6 Hours**

Orator - Chamber 4 (Paper 1)

Introducing oneself (Unit 4, Lesson 2)

Student and Teacher (Unit 3 Lesson 3)

In a College Campus (Unit 4, Lesson 1)

Orator- Chamber 4 (Paper 2)

Introducing a Person (Unit 1, Lesson 3)

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

Ordering for Food (Unit 1, Lesson 4)

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

Orator- Chamber 3

Phrasal Verbs in Conversation

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

UNIT III: Captivating Collocation **6 Hours**

Orator- Chamber 4

Types of Collocation

Collocation for Situations

UNIT IV: Idiomatic Expression **6 Hours**

Orator- Chamber 5

Idioms for Conversation

Idioms for Situations

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

Orator- Chamber 7

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

INTERNAL COMPONENTS

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

பொதுத்தமிழ் - 3 (பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: மூன்று **நேரம்: 6**

குறியீடு: 23GT3GS03 **புள்ளி: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

அலகு 1: பெருங்காப்பியங்கள்

சிலப்பதிகாரம் - வழக்குரை காதை

மணிமேகலை - ஆதிரை பிச்சையிட்ட காதை

சீவகசிந்தாமணி - பூமகள் இலம்பகம் (பாடல் எண் 2327 - 2336)

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

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

"பள்ள முதுநீர்ப் ....."

"உண்டியுட் காப்புண் ....."

" எத்துணை யாற்று ...."

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

அலகு 2: சமயக் காப்பியங்கள்

பெரியபுராணம் - பூசலார் நாயனார் புராணம்

கம்பராமாயணம் - மந்தரை சூழ்ச்சிப்படலம் (பாடல் எண் 1399 - 1428)

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

வில்லிபாரதம் - மற்போர் சருக்கம்

சீறாப்புராணம் - புலிவசனித்த படலம் **18 Hours**

அலகு 3: புதினம்

வஞ்சிமாநகரம் (வரலாற்றுப் புதினம்) **18 Hours**

அலகு 4

பாடம் தழுவிய இலக்கிய வரலாறு **18 Hours**

அலகு 5

மொழித்திறன்

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

பாடநூல்கள்

தமிழ்த்துறை வெளியீடு (தொகுப்பு) - பொதுத்தமிழ் - 3

ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி

(தன்னாட்சி), பெரியகுளம்.

முனைவர் சி. பாலசுப்பிரமணியன் - தமிழ் இலக்கிய வரலாறு

பாவை பப்ளிகேஷன்ஸ்,

சென்னை - 60. இரண்டாம் பதிப்பு - 2016.

நா. பார்த்தசாரதி - வஞ்சி மாநகரம் (வரலாற்றுப் புதினம்)

பாவை பப்ளிகேஷன்ஸ், சென்னை - 600 014

முதற்பதிப்பு ஏப்ரல் 2012

பார்வை நூல்கள்

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

Poetry and History of Hindi Literature, Technical Hindi

Semester: III **Hours: 5**

Code : 23GH3GS03 **Credit: 3**

COURSE OUTCOMES:

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

UNIT I **(15 Hours)**

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

UNIT II **(15 Hours)**

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

UNIT III **(15 Hours)**

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

UNIT IV **(15 Hours)**

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

  Banking Terms : 50 only

  Name of the Ministries: 50 only

UNIT V **(15 Hours)**

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

COURSE BOOKS:

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

The following poems have been prescribed

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

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

The following Bakthi kaal have been prescribed

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

BOOKS FOR REFERENCE:

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

The following topics have been prescribed

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

COMMUNICATIVE ENGLISH - III

Semester: III **Hours: 4**

Code : 23GE3GS03 **Credit: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I: POETRY **12 Hours**

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

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

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

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

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

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

Articles, Determiners and Quantifiers

Linking Words/ Connectives

Compound Words

Direct and Reported Speech

UNIT V: LANGUAGE COMPETENCY

Writing letters and emails

Writing in Social media platforms

[Blogs, X, Instagram, Facebook]

Learning etiquette and Email Etiquette **12 Hours**

COURSE BOOKS:

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

BOOKS FOR REFERENCE

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

WEB SOURCES

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

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

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

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

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

MECHANICS

Semester: III **Hours: 6**

Code : 23PH3MC05 **Credit: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Explain basic principles of Motion, Energy and Momentum	PSO - 1	K1
CO - 2	Summarize the dynamics of motion and its influence on energy and momentum	PSO - 2	K2
CO - 3	Solve the problems related mechanics.	PSO - 3, PSO-4	K3
CO - 4	Analyze their knowledge of the basic scientific principles and fundamental concepts in mechanics	PSO - 4	K4
CO - 5	Prioritize the applications of mechanics in daily life	PSO - 5	K5

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

Semester: III				**MECHANICS**							**Hours: 6**
Code : 23PH3MC05											**Credit: 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	3	4	4	3	5	3	4	3	4	3.81
CO - 2	3	3	2	3	3	5	3	5	3	2	3	3.18
CO - 3	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 4	4	2	5	3	2	3	4	3	3	5	2	3.27
CO - 5	3	5	2	3	5	3	3	3	3	2	5	3.36
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: NEWTON'S LAWS OF MOTION: REFERENCE FRAMES

Reference Frame-Absolute space; Time and Motion- Newton's first law of motion-Newton's first law of motion is simply a special case of second law- Limitations of Newton's laws of motion- Frames of reference: Inertial and Non-Inertial-Galilean transformation-Frames of reference with linear acceleration-Classical relativity-Galilean invariance-Transformation equations for a frame of reference inclined to an inertial frame-Transformation equations for a rotating frame of reference-Non-inertial frames-Fictitious forces-Effects of centrifugal and Coriolis forces due to earth's rotation-Foucault's pendulum-Demonstration of earth's rotations. **(18 Hours)**

UNIT II: LAW OF CONSERVATION OF ENERGY

Law of conservation of energy-Concepts of Work, Power and Energy-Conservative Forces-Energy-Conservative force as negative gradient of potential energy-curl F=0-Law of conservation of mechanical energy-Potential energy in an electric field-electric potential-Linear restoring force-Potential energy curve: Potential well-non-conservative forces-General law of conservation of energy. **(18 Hours)**

UNIT III: CONSERVATION LAWS OF LINEAR AND ANGULAR MOMENTUM

Conservation of linear momentum-Centre of mass-Motion of velocity of Centre of mass-Total linear momentum about the Centre of mass-System of two particles-Equation of motion of Centre of mass-Motion of reduced mass under inverse square force-Laboratory Centre of mass and Frames of reference-Collision-Calculation of final velocities of colliding particles-Value of the scattering angle-Systems of variable mass-The Rocket-Angular momentum-torque-Conservation of angular momentum. **(18 Hours)**

UNIT IV: DYNAMICS OF RIGID BODIES

Rigid body-Translational and rotational motion-Torque-Angular Momentum-Angular impulse-Moment of inertia-Radius of gyration-Dimensions and units of moment of inertia-Analogous parameters in translational and rotational motion-General theorems on moment of inertia-Calculation of moment of inertia-Particular cases of moment of inertia-Kinetic energy of rotation-Products of moment of inertia-Principle moments-Euler's equations of motion-Moment of inertia of a flywheel-experimental determination. **(18 Hours)**

UNIT V: GRAVITATION: FIELD AND POTENTIALS

Central forces-Inverse square law forces-Inverse square law forces and stable equilibrium-The superposition principle-Potential energy or self-energy of a multi-particle system-Gravitational self-energy of a body- uniform solid sphere-galaxy-Electrostatic self-energy of a charged body-charged sphere-Classical radius of the electron-Fundamental lengths and numbers-Two-body problem reduced to one-body problem-Reduced mass-Case of gravitational force-Equivalent one-body problem-Vibration of a diatomic molecule-Orbits-Kepler's laws-Deduction of Newton's law of gravitation from Kepler's laws. **(18 Hours)**

COURSE BOOK:

- D.S. Mathur, Mechanics, First edition, S. Chand & Co., (Reprint 2015)

  UNIT I - Chapter 2: 2.3-2.16

  UNIT II - Chapter 5: 5.1- 5.10

  UNIT III - Chapter 6: 6.1-6.14

  UNIT IV - Chapter 11: 11.1-11.14

  UNIT V - Chapter 12: 12.23-12.41

BOOKS FOR REFERENCE:

1. D. Halliday, Resnick and J. Walker, Fundamentals of Physics, 6th edition, Wiley, 2001.
2. M. Narayanamoorthy, Mechanics-Part I, Part II, National Publishing Company, 2010.
3. P. Duraipandian, Laxmi Duraipandian & Muthamizh Jayapragasam, Mechanics, S. Chand & Co, 2009.

MAJOR PRACTICAL - II

Semester: III **Hours: 4**

Code : 23PH3CP02 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Define the optical and electrical parameters of the given materials.	PSO - 1, PSO - 2	K1
CO-2	Determine the optical constants, resistance, and earth's magnetic field from the given experiments.	PSO - 2	K2
CO-3	Compare the obtained results with the theoretical value	PSO - 3	K3, K4
CO-4	Deduce the results from the required formulae	PSO - 4	K4
CO-5	Assess the results.	PSO - 5	K5

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

Semester: III				MAJOR PRACTICAL - II							Hours: 4
Code : 23PH3CP02											Credit: 3
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO-1	5	2	3	4	2	5	5	5	4	3	2	3.63
CO-2	3	2	3	4	2	5	3	5	4	3	2	3.27
CO-3	3	4	3	5	4	2	3	2	5	3	4	3.45
CO-4	3	3	5	2	3	2	3	2	2	5	3	3.00
CO-5	4	5	2	3	5	4	4	4	3	2	5	3.72
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

LIST OF PRACTICALS (Any Eight)

1. Determination of Refractive index of the prism using spectrometer.
2. Determination 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 using Ballistic Galvanometer.
5. Determination of self-inductance of the coil by Anderson's Bridge method.
6. Determination of the earth's magnetic field using Field along the axis of a coil
7. Determination of the thickness of the given thin wire by Air wedge method.
8. Determination of the frequency of an electrically maintained tuning fork by Melde's String method.
9. Determination of Resistance and Resistivity of a wire using Carey Foster's bridge.
10. Estimation of the specific rotation of sugar solution using Polarimeter.

ALLIED PHYSICS - I

MECHANICS, PROPERTIES OF MATTER AND THERMAL PHYSICS

Semester: III **Hours: 3**

Code : 23PH3AC3A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the fundamental laws of Mechanics, Properties of Matter and heat transfer.	PSO - 1	K1
CO - 2	Explain the concepts of friction, bending of beams, Greenhouse effect, and Carnot's cycle.	PSO - 2	K2
CO - 3	Apply the principles of mechanics, fluid motion and thermodynamics to solve the problems	PSO - 3	K3
CO - 4	Examine the acquired knowledge through various experiments on elasticity, viscosity and heat	PSO - 3, PSO - 4	K4
CO - 5	Assess the importance of mechanics, properties of matter and thermal physics in real life situation.	PSO - 5	K5

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

Semester: III				**ALLIED PHYSICS - I: MECHANICS, PROPERTIES OF MATTER AND THERMAL PHYSICS**							**Hours: 3**
Code : 23PH3AC3A											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	4	2	3	3	2	5	4	5	3	3	2	3.27
CO - 3	4	2	3	5	2	3	4	3	5	3	2	3.27
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	3	4	3	2	2	5	3.36
Overall Mean Score												**3.29**

Result: The score for this course is **3.29** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: FORCE, WORK, POWER AND ENERGY

Newton's law of gravitation - Coulomb's law - Central Forces - Conservative Forces - Non-Conservative Forces - Friction - Limiting friction - Coefficient of Friction and Angle of Friction - Laws of Friction - Motion of bodies along an inclined plane - Work - Work done by a varying force - Energy - Kinetic Energy - Potential Energy - Power. **(9 Hours)**

UNIT II: ELASTICITY

Young's modulus - Rigidity modulus - Bulk modulus - Poisson's ratio (definition alone) - Bending of beams - Expression for bending moment - Determination of young's modulus - uniform and non-uniform bending - Torsional oscillation of a body - Rigidity modulus by torsion Pendulum. **(9 Hours)**

UNIT III: VISCOSITY

Viscosity - Derivation of Poiseuille's Formula - Poiseuille's method for determining coefficient of viscosity of a liquid - Equation of continuity - Bernoulli's Theorem - Applications of Bernoulli's Theorem - Venturimeter - Pitot Tube. **(9 Hours)**

UNIT IV: CONDUCTION, CONVECTION AND RADIATION

Thermal conductivity - Lee's disc method of determining the thermal conductivity of a bad conductor - Analogy between heat flow and electric current - Convection in the atmosphere - Lapse rate - Greenhouse effect - Atmospheric pollution - Radiation - Stefan's Law - Solar constant - Temperature of the Sun - Statement of Planck's law of radiation - Wien's Law - Rayleigh-Jeans law. **(9 Hours)**

UNIT V: THERMODYNAMICS

Heat engine - Expression for the efficiency of a Carnot's engine - Carnot's theorem - Second law of thermodynamics - Entropy - Change of entropy in a Carnot's cycle - Change of entropy in conversion of ice into steam. **(9 Hours)**

COURSE BOOKS:

1. R. Murugeshan, Mechanics, Properties of Matter and Sound, I Edition, Annai Print Park, Madurai, July 2016.

   UNIT I: Chapter 1: All sections

   UNIT II: Chapter 4: 4.2 - 4.5, 4.7, 4.8, 4.12, 4.13

   UNIT III: Chapter 5: All sections

2. R. Murugeshan, Thermal Physics, I Edition, Annai Print Park, Madurai, June 2012.

   UNIT IV: Chapter 3: 3.1- 3.3

   Chapter 4: 4.1- 4.3, 4.5, 4.6

   Chapter 5: 5.1, 5.2, 5.4, 5.6, 5.7, 5.10 - 5.12

   UNIT V: Chapter 7: 7.1- 7.7

BOOKS FOR REFERENCE:

1. Brijlal and Subramanyam, Properties of Matter, III Edition, Eurasia Publishing Co., New Delhi, 1983.
2. D.S. Mathur, Elements of Properties of Matter, 10thEdition, S. Chand & Company Ltd., New Delhi, 1976.
3. Brijlal & Subramanyam, Heat and Thermodynamics, 16thEdition, S. Chand & Co, 2005.

ALLIED PHYSICS - I
GRAVITATION, HEAT AND SOUND

Semester: III **Hours: 3**
Code : 23PH3AC3B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the fundamentals of gravitation, heat and sound.	PSO-1	K1
CO - 2	Explain the concepts of artificial satellites, thermal expansion of matter, thermodynamic processes, and various phenomena of fluid and simple oscillation.	PSO-2	K2
CO - 3	Apply the principles of compound pendulum, thermostat, superconductivity and stationary waves to solve the problems.	PSO-3	K3
CO - 4	Examine the acquired knowledge through various experiments on Boy's method, Regnault's method, porous plug and Lissajous figures.	PSO-4	K4
CO - 5	Assess the importance of gravitation, heat and sound in real life situation.	PSO-5	K5

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

Semester: III				**ALLIED PHYSICS - I GRAVITATION, HEAT AND SOUND**							**Hours: 3**
Code : 23PH3AC3B											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	4	2	3	3	2	5	4	5	3	3	2	3.27
CO - 3	3	2	3	5	2	3	3	3	5	3	2	3.09
CO - 4	3	2	5	3	2	3	3	3	3	5	2	3.09
CO - 5	4	5	2	2	5	3	4	3	2	2	5	3.36
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: GRAVITATION

Kepler's law of planetary motion - Newton's Law of gravitation - Mass and density of the earth - Boy's method -Compound Pendulum-Expression for period - Experiment to find g -Variation of g with latitude, altitude and depth-Artificial satellites. **(9 Hours)**

UNIT II: THERMAL EXPANSION

Expansion of solids - Determination of the coefficient of linear expansion of a crystal -Expansion of anisotropic solids - Solids of low expansivity and their uses - Anomalous expansion of water - Thermostat. **(9 Hours)**

UNIT III: ISOTHERMAL AND ADIABATIC CHANGES

Isothermal change - Adiabatic change - Equation for the adiabatic change of a perfect gas - Two specific heat capacities of a gas - Difference between the two specific heat capacities - Joly's differential steam calorimeter for finding C_v - Regnault's method to find C_p **(9 Hours)**

UNIT IV: LOW TEMPERATURE PHYSICS

Joule - Kelvin effect - Porous plug experiment - Theory of Porous plug experiment - Definition of temperature of inversion - Relation between temperature of inversion and critical temperature - Adiabatic demagnetization - Principle - Curie's law - Giauque's method - Superconductivity. **(9 Hours)**

UNIT V: SOUND

Simple harmonic oscillation - Composition of two simple harmonic motions in a straight line - Composition of two simple harmonic motions of equal time periods at right angles - Experimental method for obtaining Lissajous figures - Progressive waves - Stationary waves - Acoustic of buildings - Ultrasonics - Applications of ultrasonic waves. **(9 Hours)**

COURSE BOOKS:

1. R. Murugeshan, Mechanics, Properties of Matter and Sound, I Edition, Annai Print Park, Madurai, July 2016.

   UNIT I: Chapter 3: All sections

   UNIT V: Chapter 6: All sections

2. R. Murugeshan, Thermal Physics, I Edition, Annai Print Park, Madurai, June 2012.

   UNIT II: Chapter 1: All sections

   UNIT III: Chapter 2: All sections

   UNIT IV: Chapter 8: All sections

BOOKS FOR REFERENCE:

1. D.S. Mathur, Mechanics, 1st Edition, S. Chand & Company Ltd., New Delhi, 1981.
2. R. Murugeshan and Er. Kiruthika Sivaprasath, Properties of Matter and Acoustics, Revised Edition, S. Chand & Company Ltd., New Delhi, 2012.
3. D.S. Mathur, Heat and Thermodynamics, 5th Edition, Sultan Chand & Sons, New Delhi, 2014.

ALLIED PHYSICS PRACTICAL - I: PROPERTIES OF MATTER PRACTICAL

Semester: III **Hours: 2**
Code : 23PH3AP3A **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the required equipment and its purpose	PSO - 1	K1
CO - 2	Explain the concepts of elasticity moduli, viscosity and sound	PSO - 2	K2
CO - 3	Demonstrate the experiment through acquired knowledge	PSO - 3	K3
CO - 4	Deduce the results from appropriate formula	PSO - 3, PSO - 4	K4
CO - 5	Assess the results with the standard values	PSO - 5	K5

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

Semester: III				ALLIED PHYSICS PRACTICAL - I: PROPERTIES OF MATTER PRACTICAL						Hours: 2	
Code : 23PH3AP3A										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	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	4	2	3	3	2	5	4	5	3	3	2	3.27
CO - 3	3	3	3	5	3	3	3	3	5	3	3	3.36
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	3	4	3	2	2	5	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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF PRACTICALS (Any 6)

1. Determination of Young's Modulus by Uniform Bending using Pin and Microscope method.
2. Determination of thermal conductivity of a bad conductor using Lee's disc method.
3. Verification of Newton's law of cooling.
4. Determination of Young's Modulus by Non - Uniform Bending using optic lever-Telescope and Scale method.
5. Determination of rigidity modulus using Torsion Pendulum.
6. Determination of g using Compound Pendulum.
7. Determination of co-efficient of Viscosity by Stoke's Method.
8. Determination of frequency of AC mains using Sonometer.

ALLIED PHYSICS PRACTICAL – I:
PROPERTIES OF MATTER, HEAT AND SOUND PRACTICAL

Semester: III **Hours: 2**
Code : 23PH3AP3B **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the required equipment and its purpose	PSO - 1	K1
CO - 2	Explain the concepts of gravitation, heat and sound	PSO - 1, PSO - 2	K2
CO - 3	Demonstrate the experiment through acquired knowledge	PSO - 3	K3
CO - 4	Deduce the result from appropriate formula	PSO - 3, PSO - 4	K4
CO - 5	Assess the results with the standard values	PSO - 5	K5

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

Semester: III				**ALLIED PHYSICS PRACTICAL - I:PROPERTIES OF MATTER, HEAT AND SOUND PRACTICAL**							**Hours: 2**
Code : 23PH3AP3B											**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	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	3	3	3	5	3	3	3	3	5	3	3	3.36
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	3	4	3	2	2	5	3.36
Overall Mean Score												**3.34**

Result: The score for this course is **3.34** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any 6)

1. Determination of rigidity modulus using Torsion Pendulum with mass.
2. Determination of rigidity modulus using Static torsion method.
3. Determination of Young's Modulus by Non-Uniform Bending using Pin and Microscope method.
4. Determination of Young's Modulus by Uniform Bending using optic lever - Telescope and Scale method.
5. Determination of the temperature coefficient of resistance of the material of the coil using Carey Foster's bridge.
6. Determination of the frequency of an electrically maintained tuning fork by Melde's string.
7. Verification of laws of transverse vibrations of stretched string by Sonometer.
8. Determination of solar constant and temperature of Sun using Lee's disc method.

ALLIED: GENERAL CHEMISTRY-I

Semester: III **Hours: 3**

Code : 23CH3AC3A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the elements in periodic table and electronic configuration, types of bonding and reactions, chromatographic techniques, thermal analysis and fundamentals of chemical kinetics	PSO - 1	K1
CO - 2	Describe periodic variation, bonding and reactions, separation techniques, thermal analysis and the terms in chemical kinetics	PSO - 2	K2
CO - 3	Illustrate the periodic properties of elements, VB and MO concepts, chromatographic methodology and kinetics of reactions	PSO - 3	K3
CO - 4	Analyse the characteristics of s,p,d,f block elements, types of chemical bonding, VB and MO theories, chromatographic techniques, thermal analysis and kinetics of chemical reactions	PSO - 4	K4
CO - 5	Deduce the features of periodic table, MO diagram, applications of Grignard reagents, chromatographic seperation, application of TGA, DTA, DSC and chemical kinetics	PSO-5	K5

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

Semester: III				**ALLIED: GENERAL CHEMISTRY-I**					**Hours: 3**			
Code : 23CH3AC3A										**Credit: 3**		
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	4	3	3	5	4	3	3	3	3.63
CO - 2	2	3	5	5	4	3	2	5	3	3	4	3.55
CO - 3	4	5	3	3	4	3	4	3	5	3	4	3.72
CO - 4	3	3	4	4	3	5	3	4	3	5	3	3.63
CO - 5	4	3	3	3	5	3	4	3	3	3	5	3.55
Overall Mean Score												**3.62**

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

Note:

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

Values Scaling:

Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	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 variation: atomic radii, ionic radii, ionization energy, electron affinity and electronegativity **(9 Hours)**

UNIT II: CHEMICAL BONDING:

Definition and 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 of 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 and 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: column chromatography, paper chromatography and Thin Layer Chromatography (TLC) - demonstration: separation of a mixture containing polar and non-polar compounds - 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:

- A. Mary Imelda Jayaseeli, M. Kalanithi, C. Mary Anbarasi, S. Pooranalakshmi, Allied Chemistry III and IV, Shanlax publications., Madurai, 1st Edition, 2022.
  Unit I-V

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M Chawla, Text book of Organic Chemistry, Sultan Chand and Sons, Educational Publishers, Reprint, 2014.
2. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic Chemistry, Vishal Publishing Co., 33rd Edition, 2022-2023.
3. P.L. Soni and M. Katyal, Test book of Inorganic Chemistry, Sultan Chand and Sons, Reprint, 2013.

ALLIED: GENERAL ASPECTS OF CHEMISTRY-I

Semester: III **Hours: 3**
Code : 23CH3AC3B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the properties of hydrogen, hydrogen peroxide, oxides and ozone, ideal and real gases, amino acids, alkaloids and terpenoids	PSO-1	K1
CO - 2	Explain the properties of hydrogen, hydrogen peroxide, oxides and ozone, ideal and real gases, carbohydrate, alkaloids and terpenoids	PSO-2	K2
CO - 3	Estimate the structure of hydrogen peroxide, ozone, carbohydrates, alkaloids and terpenoids and deviation of real gases	PSO-3	K3
CO - 4	Analyse the strength of hydrogen peroxide, behaviour of real gases, reducing and non reducing sugars, alkaloids and terpenoids	PSO-4	K4
CO - 5	Evaluate the properties of hydrogen, hydrogen peroxide, oxides and ozone, ideal and real gases, amino acids, alkaloids and terpenoids	PSO-5	K5

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

Semester: III				**GENERAL ASPECTS OF CHEMISTRY-I**							**Hours: 3**
Code : 23CH3AC3B											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	4	3	3	5	4	3	3	3	3.63
CO - 2	2	3	5	5	4	3	2	5	3	3	4	3.55
CO - 3	4	5	3	3	4	3	4	3	5	3	4	3.72
CO - 4	3	3	4	4	3	5	3	4	3	5	3	3.63
CO - 5	4	3	3	3	5	3	4	3	3	3	5	3.55
Overall Mean Score												**3.62**

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

Note:

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

Values Scaling:

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

UNIT I: a) HYDROGEN:

Isotopes of hydrogen - separation of the isotopes - properties and uses of heavy hydrogen - position of hydrogen in the periodic table - ortho and para hydrogen - separation - difference in structure and properties - hydrides - definition - classification - preparation and properties

b) HYDROGEN PEROXIDE:

Manufacture, properties, structure and uses of hydrogen peroxide - estimation of hydrogen peroxide by permanganimetry - strength of hydrogen peroxide: volume strength, normality and percentage - calculation of strength on these different terms **(9 Hours)**

UNIT II: OXIDES, WATER AND OZONE:

Oxides: classification based on their chemical behaviour - acidic, basic, neutral and amphoteric oxides - based on their oxygen content - normal, sub, poly and mixed oxides - thermal stability of oxides

Water: water quality parameters: pH, hardness - types of hardness and degree of hardness, dissolved oxygen, biological oxygen demand and total dissolved oxygen

Ozone: preparation - manufacture - properties - composition - structure and uses **(9 Hours)**

UNIT III: GASEOUS STATE:

Postulates of kinetic theory of gases - expression for pressure of gases based on kinetic theory - deducing the basic gas laws - deviation of real gases from ideal behaviour - reasons for deviation - derivation of van der Waals gas equation - explanation of behaviour of real gases based on van der Waals gas equation **(9 Hours)**

UNIT IV: a) CARBOHYDRATES:

Definition - sources - classification - reducing and non-reducing sugars - properties of glucose: addition with HCN, $NaHSO_3$ and phenyl hydrazine-sucrose: inversion of sucrose - uses - ring and Haworth structure of glucose and fructose - tests for carbohydrates

b) AMINO ACIDS:

Classification - properties: dipolar structure - Zwitter ion - uses

c) PROTEINS:

Color reactions of proteins - structure of protein - vitamins: classification - sources - deficiency diseases **(9 Hours)**

UNIT V: a) ALKALOIDS:

Definition - occurrence - extraction of alkaloids and general properties - classification of alkaloids - structures of coniine, piperine and nicotine (structural elucidation not required)

b) TERPENOIDS:

Introduction - classification - occurrence - isolation - general properties - isoprene rule - structures of citral, geraniol, terpeniol, menthol and dipentene (structural elucidation not required) **(9 Hours)**

COURSE BOOKS:

1. K. Ratinamuthu, R.Victoria, Semester - I, Text book of Ancillary Chemistry, Educational Publishers, Madurai. **Unit I-III**
2. Mary Imelda Jayaseeli, M. Kalanithi, C. Mary Anbarasi, Sr. T. Johny Dathees, and Sr. S. Sahaya Lenus, Allied Chemistry III and IV, New Century Book House (P) Ltd., Chennai, 1st Edition, 2020. **Unit IV**
3. K. Ratinamuthu, R.Victoria, Semester - IV, Text book of Ancillary Chemistry, Educational Publishers, Madurai. **Unit V**

ALLIED PRACTICAL: ORGANIC ANALYSIS

Semester: III **Hours: 2**

Code : 23CH3AP3A **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the procedure of micro qualitative analysis of organic substances	PSO - 1	K1
CO - 2	Explain the procedures to detect the presence of a special element, nitrogen and functional group	PSO - 2	K2
CO - 3	Apply skills in systematic microscale analysis	PSO - 3	K3
CO - 4	Analyse the functional groups in organic substance	PSO - 4	K4
CO - 5	Adopt safety measures in handling chemicals	PSO - 5	K5

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

Semester: III				**ALLIED PRACTICAL: ORGANIC ANALYSIS**							**Hours: 2**
Code : 23CH3AP3A											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	4	4	4	3	4	5	4	4	4	3	4.00
CO - 2	4	3	5	5	3	3	4	5	3	3	3	3.73
CO - 3	3	5	4	4	4	4	3	4	5	4	4	4.00
CO - 4	3	3	4	4	4	5	3	4	3	5	4	3.82
CO - 5	3	3	4	4	5	4	3	4	3	4	5	3.82
Overall Mean Score												**3.87**

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

Note:

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

Values Scaling:

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

Microscale Analysis of the Organic Substance 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 organic substance is identified as

i) Aliphatic or aromatic

ii) Saturated or unsaturated

iii) Special elements present /absent

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

BOOK FOR REFERENCE:

Practical manual prepared by the PG and Research Center of Chemistry, Reprint, 2023

ALLIED PRACTICAL: SEMIMICRO INORGANIC QUALITATIVE ANALYSIS

Semester: III **Hours: 2**

Code : 23CH3AP3B **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire skills to perform precipitation and centrifugation methods	PSO-1	K1
CO - 2	Explain cations and anions present in a given inorganic sample adopting the systematic procedure	PSO-2	K2
CO - 3	Apply the procedures of analysis to check the quality of an inorganic substance	PSO-3	K3
CO - 4	Analyse the characteristics reaction of cation and anion in a given sample	PSO-4	K4
CO - 5	Adopt safety measures in handling chemicals	PSO-5	K5

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

Semester: III				ALLIED PRACTICAL: SEMIMICRO INORGANIC QUALITATIVE ANALYSIS						Hours: 2	
Code : 23CH3AP3B										Credit: 1	
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	3	4	4	3	3	5	4	3	3	3	4.00
CO - 2	4	3	5	5	3	3	4	5	3	3	3	3.73
CO - 3	4	5	4	4	3	3	4	4	5	3	3	4.00
CO - 4	3	4	3	3	4	5	3	3	4	5	4	3.82
CO - 5	3	3	3	3	5	4	3	3	3	4	5	3.82
Overall Mean Score												3.87

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

Note:

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

Values Scaling

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

Analysis of a simple salt containing one cation and one anion

i) ANIONS:

Carbonate, sulphate, nitrate, chloride, bromide, oxalate, borate, phosphate, chromate and fluoride

ii) CATIONS:

Lead, copper, cadmium, bismuth, antimony, iron, aluminium, zinc, manganese, cobalt, nickel, barium, strontium, calcium, magnesium and ammonium

COURSE BOOK:

1. V. Venkateswaran, R. Veerasamy and A. R. Kulandaivelu, Basic Principles of Practical Chemistry, Sultan Chand and sons, Reprint 2023.

DIGITAL PHOTOGRAPHY

Semester: III **Hours: 1**

Code : 23SE3PH03 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Describe the functions of camera and photographic techniques.	PSO - 1	K1
CO-2	Compare different types photographic techniques.	PSO - 2	K2
CO-3	Use various functional skills in camera.	PSO - 3	K3
CO-4	Analyze an image technically by adapting variety of methods.	PSO - 4	K4
CO-5	Demonstrate artistry by creating images that evoke emotional response.	PSO - 4, PSO - 5	K5

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

Semester: III			**# DIGITAL PHOTOGRAPHY**								**Hours: 1**
Code : 23SE3PH03											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	4	3	3	4	3	5	3	3	3	4	3.63
CO-2	3	2	3	3	2	5	3	5	3	3	2	3.09
CO-3	3	4	4	5	4	3	3	3	5	4	4	3.81
CO-4	2	3	5	3	3	4	2	4	3	5	3	3.36
CO-5	2	5	5	3	5	3	2	3	3	5	5	3.72
Overall Mean Score												**3.52**

Result: The score for this course is **3.52** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: CAMERA AND PHOTOGRAPHS

Camera Equipment - Basic camera Controls - Camera Settings - Special Photographs - Seeing Well - Photographic Assignment. **(3 Hours)**

UNIT II: LENSES AND FOCAL LENGTH

Camera Lenses - Wide angle Lenses- Zoom Lenses - Special Purpose Lenses - Focal Length - Behind the Lens - Photographic Assignment. **(3 Hours)**

UNIT III: SHUTTER SPEEDS

Experimenting with Shutter Speeds - Purpose of Shutter Speed - Fast Shutter Speeds - Slow Shutter Speeds - Panned - Action Images - Ghosting and Long Exposures- Photographic Assignment. **(3 Hours)**

UNIT IV: APERTURE AND DEPTH OF FIELD

Aperture Number - Reason for out of focus images - Greater Depth of Field - Amount of Light and Aperture Setting- Photographic Assignment. **(3 Hours)**

UNIT V: LIGHT

Shooting in Ambient Light - Quality of Light - Types of Light - Color of Light - Making the Best Use of Light - Light with Reflectors - Flash - Flash for Freezing Action - Photographic Assignment. **(3 Hours)**

COURSE BOOK:

- Joel Sartore, Fundamentals of Photography, Course Guidebook of National Geographic, The Great Courses Company, USA - 2012.

UNIT I : Chapter 2: Pages: 8 - 12 & Chapter 1: Pages: 4 - 6

UNIT II : Chapter 3: Pages: 14 - 19

UNIT III : Chapter 4: Pages: 20 - 25

UNIT IV : Chapter 5: Pages: 27 - 31

UNIT V : Chapter 6: Pages: 33, 37 - 38, Chapter 7: Pages: 40,44, Chapter 8: Pages: 47 - 48, 51

BOOKS FOR REFERENCE:

1. Michel J. Langford, Anna Fox & Richard Sawdon Smith, Basic photography, 9th Edition, Focal Press, London - 2010
2. Mark Galer, Digital Photography in Available Light essential skills, Focal Press, London, 2006
3. Paul Harcourt Davies, The Photographer's practical handbook, UK PRESS, 2005

PHYSICS OF MUSIC

Semester: III **Hours: 2**

Code : 23PH3GE01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand the basic principles of frequency, music tone, sound and recording	PSO - 1	K1
CO - 2	Classify, sounds and its properties, music instruments and vibrating systems	PSO - 2	K2
CO - 3	Summarize the properties needed for the production and recording	PSO - 3	K3
CO - 4	Correlate human and animal sound, travelling and standing wave, analog and digital systems, continuous and discrete Fourier transforms.	PSO - 4	K4
CO - 5	Evaluate quality of sound, digitization and recording	PSO - 4, PSO - 5	K5

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

Semester: III				**# PHYSICS OF MUSIC**							**Hours: 2**
Code : 23PH3GE01											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	4	2	3	5	3	4	3	2	3.27
CO - 2	3	3	2	3	3	5	3	5	3	2	3	3.18
CO - 3	3	3	4	5	3	3	3	3	5	4	3	3.54
CO - 4	3	3	5	3	3	2	3	2	3	5	3	3.18
CO - 5	2	5	5	4	5	3	2	3	4	5	5	3.90
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: SCIENTIFIC STUDY OF MUSIC

Sound and Music- concepts- sound waves - sound and music worksheet - Longitudinal and transverse wave - frequency- wavelength - pitch - sound amplitude and musical dynamics - difference in waves - related activities. **(6 Hours)**

UNIT II: SIMPLE VIBRATING SYSTEMS

Musical Intervals, Frequency and Ratio - Harmonic series - Physics, Harmonics and color - Harmonics of Brass instrument - Playing Harmonics on strings - Powers, roots and equal temperament - tuning systems - tuning based on harmonic series - related problems **(6 Hours)**

UNIT III: MUSICAL TONE

Parts of the Ear- module- Pythagorean Intonation- Mean tone System- Just Intonation -Whole Step ratios written as decimals - different kinds of Temperament - Comparison of Equal Temperament with harmonic series - Beats and Wide tuning **(6 Hours)**

UNIT IV: STANDING WAVES AND INSTRUMENTS

Standing wave and musical instruments- standing waves on strings- standing waves in wind instruments- standing waves in other objects- what makes the standing wave in a tube - harmonic series in tubes- basic wind instrument tube types.

(6 Hours)

UNIT V: CLASS ROOM ACTIVITIES

Waves in Students- Jump ropes and slinkies - strings activity - wind instrument activity - percussion activity - Instrument Body Activity - wind instrument - pipes.

(6 Hours)

COURSE BOOKS:

- Catherine Schmidt Jones, Sound, Physics and Music, Rice University, Housten Texas, 2013

  UNIT I: Chapter1: 1.1- 1.4

  UNIT II: Chapter 2: 2.1-2.2

  UNIT III: Chapter 2: 2.2-2.4

  UNIT IV: Chapter 3: 3.1-3.2

  UNIT V: Activities included in the book

BOOKS FOR REFERENCE:

1. Bryan H. Suits, Physics Behind Music, An Introduction, 2023
2. Stephon Alxander, The Jazz of Physics: The Secret Link Between Music and the Structure of the Universe, 2016

PART IV - NATIONAL CADET CORPS

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

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO. NO.	UPON COMPLETION OF THE COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
1	Reinforce the aims, motto, vision and mission of the NCC through the academic curriculum.	PO-1, 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-2, PO-5, PO-6

GE - 1: NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT

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

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

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

Semester: III				**GE-1: NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT**							**Hours: 2**
Code : 23GE3NC01											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	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 = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

GE-1: NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT

2hrs/Week

UNIT I

National Integration **6 Hours**

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

UNIT II

Civil Affairs **6 Hours**

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

UNIT III

Civil Defence and Self Defence **6 Hours**

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

UNI IV

Leadership And Personality Development **6 Hours**

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

UNIT V

Soft Skills **6 Hours**

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

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

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

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

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - 2023-2026

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

AEC-3 ENVIRONMENTAL STUDIES

Semester: III **Hours: 2**

Code : 23AE3ES03 **Credit: 2**

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 the need for public awareness	PO-1
2.	Develop a deeper understanding in the classification of resources	PO - 2
3.	Analyze the concept of the ecosystem	PO-3
4.	Comprehend the definitions, causes and control measures of environmental pollutions	PO-4
5.	Participate in the environmental issues programmes from the unsustainable to sustainable development	PO - 5, PO-6

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I: NATURAL RESOURCES

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

(6 Hours)

UNIT II: ECOSYSTEMS

Concept, structure and function of an ecosystem - energy flow in the ecosystem - food chains, food webs and ecological pyramids - Types, characteristic features, structure and function of Forest, grassland, desert and aquatic ecosystems. **(6 Hours)**

UNIT III: ENVIRONMENTAL POLLUTION

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

UNIT IV: SOCIAL ISSUES AND THE ENVIRONMENTS

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

UNIT V: BIODIVERSITY IN THENI DISTRICT

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

(6 Hours)

FIELDWORK

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

COURSE BOOK:

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

UNIT I : Section - 1.3 to 1.37

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

UNIT III : Section - 3.1 to 3.37

UNIT IV : Section - 4.1 to 4.17

UNIT V :

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

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

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

Note:

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

(ii) UNIT-V materials prepared by Staff

Continuous Internal Assessment Component (CIA)

Theory:

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

Continuous Internal Assessment Component (CIA)

Passing Minimum: 40% out of 100

Internal Question Pattern

Part - A

10 Questions × 1Mark =10 Marks

Part - B

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

Part - C

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

(Open Choice and at least one Question from

பொதுத் தமிழ் - 4

(பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: நான்கு **நேரம்: 6**

குறியீடு: 23GT4GS04 **புள்ளி: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

அலகு 1: எட்டுத் தொகை

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

அலகு 2: பத்துப் பாட்டு

நெடுநல்வாடை - நக்கீரர் **18 Hours**

அலகு 3: நாடகம்

சபாபதி - பம்மல் சம்பந்த முதலியார் **18 Hours**

அலகு 4: இலக்கிய வரலாறு

பாடம் தழுவிய இலக்கிய வரலாறு **18 Hours**

அலகு 5: மொழித்திறன்

மொழிபெயர்ப்பு / கலைச்சொற்கள்

கொடுக்கப்பட்டுள்ள ஆங்கிலப் பகுதியைத் தமிழில் மொழிபெயர்த்தல்.

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

பாட நூல்கள்

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

பார்வை நூல்கள்

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

General Essay, Translation and Letter Writing, Alankar

Semester: IV **Hours: 5**

Code : 23GH4GS04 **Credit: 3**

COURSE OUTCOMES:

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

UNIT I **(15 Hours)**

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

UNIT II **(15 Hours)**

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

UNIT III **(15 Hours)**

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

UNIT IV **(15 Hours)**

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

UNIT V **(15 Hours)**

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

COURSE BOOKS:

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

The follo wing Sahityotar (General) essay have been prescribed

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

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

The following Alankar have been prescribed

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

BOOKS FOR REFERENCE:

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

The following topics have been prescribed

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

COMMUNICATIVE ENGLISH - IV

Semester: IV **Hours: 4**

Code : 23GE4GS04 **Credit: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I: POETRY **12 Hours**

Dahlia Ravikovitch - "Pride"

Maya Angelou - "Phenomenal Woman"

William Wordsworth - " The Tables Turned"

UNIT II: LIFE STORY **12 Hours**

Adeline Yen Mah - From *Chinese Cinderella*

George Orwell - "Why I Write"

UNIT III: SHORT STORY **12 Hours**

O Henry - "A Retrieved Reformation"

Extract from a play

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

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

UNIT IV: GRAMMAR **12 Hours**

Types of Sentences

Question Tags

UNIT V: DRAFTING **12 Hours**

Reading Comprehension

Book Review

Product Review

Resume Writing

COURSE BOOKS

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

BOOKS FOR REFERENCE

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

WEB SOURCES:

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

OPTICS AND SPECTROSCOPY

Semester: IV **Hours: 6**

Code : 23PH4MC06 **Credit: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain the properties and behavior of light.	PSO -1, PSO - 2	K1
CO-2	Describe the interaction of light with obstacles and matter.	PSO -1, PSO - 3	K2
CO-3	Apply the knowledge of interferometers, diffractometers and polarimeters and perform experiments.	PSO - 3	K3
CO-4	Categorize the optical phenomena, classify the instruments and their techniques	PSO - 1, PSO - 4	K4
CO-5	Measure the resolving, dispersive power of optical instruments and specific rotation of liquids	PSO - 4, PSO - 5	K5

RELATIONSHIP MATRIX FOR COURSE OUTCOMES, PROGRAMME OUTCOMES AND PROGRAMMESPECIFIC OUTCOMES

Semester: IV				**OPTICS AND SPECTROSCOPY**							**Hours: 6**
Code : 23PH4MC06											**Credit: 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	2	2	3	2	5	5	5	3	2	2	3.27
CO-2	5	2	2	5	2	5	5	5	5	2	2	3.63
CO-3	3	2	3	5	2	3	3	3	5	3	2	3.09
CO-4	5	2	5	3	2	4	5	4	3	5	2	3.63
CO-5	3	5	5	3	5	3	3	3	3	5	5	3.90
Overall Mean Score												**3.51**

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

Note:

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

Values Scaling:

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

UNIT I: 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.

RESOLVING POWER

Resolving power - Rayleigh's criterion - Limit of resolution of the eye and convex lens - Resolving power of a prism and grating. **(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.

FRAUNHOFER DIFFRACTION

Fraunhofer diffraction at a single slit - Circular aperture - Plane diffraction grating- Theory - Determination of wavelength of light - Dispersive power of grating.

(18 Hours)

UNIT III: POLARIZATION

Natural light - Unpolarized and 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 linear and circularly polarized lights - Optical activity - Fresnel's theory - Experimental verification - Specific rotation - Lorentz half shade Polarimeter. **(18 Hours)**

UNIT IV: SPECTROSCOPY

Origin of Molecular Spectra - Nature of Molecular Spectra - Different modes of molecular excitation - Factors affecting line width of molecular spectra - Factors affecting intensity of molecular spectra - Born-Oppenheimer approximation- Rotation of linear system - Theory of the origin of pure rotational spectrum of a molecule - Non-rigid rotator (diatomic molecule as non - rigid rotator) - The energy of a Diatomic molecule- Vibrating Diatomic Molecule as a Harmonic Oscillator - Diatomic vibrating rotator - Theory of the origin of the vibration - Rotation spectrum of a molecule - Infra-red spectra. **(18 Hours)**

UNIT V: RAMAN SCATTERING

Scattering of Light - Experimental study of Raman effect - Quantum theory of Raman effect - Classical theory of Raman effect - Vibrational Raman spectra of diatomic molecule- Complementary character of Raman and infrared spectra - Application of Raman effect - Techniques and Instrumentation of Raman Spectrometer.

(18 Hours)

COURSE BOOKS:

1. Subramaniyam and Brijlal, A Text book of Optics, 25th edition, S. Chand & Company, New Delhi - 2, Reprint 2018.

   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

   Chapter 19: 19.1-19.5, 19.11, 19.12

   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 20: 20.1-20.4, 20.5.1- 20.5.4, 20.10- 20.11.3, 20.17, 20.19.1-20.21.1, 20.27, 20.29-20.32

2. R. Murugeshan & Kiruthiga Sivaprasath, Modern Physics, 18th Edition, S. Chand & Company, New Delhi.

   UNIT IV: Chapter 14: 14.1 - 14.5, 14.7,14.9

   UNIT V: Chapter 14: 14.12 - 14.18

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 PRACTICAL - III

Semester: IV **Hours: 3**

Code : 23PH4CP03 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Identify the physical quantities and the principles behind each experiment.	PSO - 1	K1
CO-2	Express the formulae and demonstrate the experiments.	PSO - 2, PSO - 3	K2
CO-3	Interpret and calculate the required parameters in optical, thermal and electrical fields.	PSO - 3, PSO - 4	K3
CO-4	Compare the observed and theoretical values of the Physical parameters	PSO - 4	K4
CO-5	Assess the results	PSO - 5	K5

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

Semester: IV				**MAJOR PRACTICAL - III**							**Hours: 3**
Code : 23PH4CP03											**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	2	3	3	2	3	5	3	3	3	2	3.09
CO-2	3	2	2	5	2	5	3	5	5	2	2	3.27
CO-3	3	2	5	5	2	2	3	2	5	5	2	3.27
CO-4	3	3	5	3	3	3	3	3	3	5	3	3.36
CO-5	3	5	3	3	5	3	3	3	3	3	5	3.54
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF PRACTICALS (Any Eight)

1. Study the relationship between angle of incidence (i) and angle of deviation (d) - i-d curve using Spectrometer.
2. Study the relationship between angle of incidence (i) and angle of emergence (i') - i-i' curve using 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 of Mutual Inductance of the given pair of coils using Ballistic Galvanometer.
6. Determination of Thermal conductivity of a bad conductor by Lee's Disc method.
7. Comparison of capacitances using De Sauty's bridge.
8. Determination of the Charge of an electron using Copper Voltameter.
9. Determination of absolute capacity of a condenser using Ballistic Galvanometer.
10. Conversion of galvanometer into Ammeter.

ALLIED PHYSICS - II

ELECTRICITY, ELECTRONICS AND MODERN PHYSICS

Semester: IV **Hours: 3**

Code : 23PH4AC4A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the laws of electricity, electronics and modern physics	PSO - 1	K1
CO - 2	Explain the concepts of current electricity, semiconductor devices, atomic and nuclear physics	PSO - 1, PSO - 2	K2
CO - 3	Apply the principles of electricity, electronics and modern physics to solve the problems	PSO - 2, PSO - 3	K3
CO - 4	Examine the acquired knowledge through various experiments and models	PSO - 3, PSO - 4	K4
CO - 5	Assess the importance of electricity, electronics and modern physics in real life situation.	PSO - 5	K5

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

Semester: IV				**ELECTRICITY, ELECTRONICS AND MODERN PHYSICS**							**Hours:3**
Code:23PH4AC4A											**Credit:3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	2	3	3	2	3	5	3	3	3	2	3.09
CO-2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO-3	3	2	3	5	2	5	3	5	5	3	2	3.45
CO-4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO-5	4	5	2	2	5	3	4	3	2	2	5	3.36
Overall Mean Score												**3.36**

Result: The score for this course is **3.36** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: CURRENT ELECTRICITY

Kirchhoff's laws - Wheatstone's network- Carey-Foster's bridge - measurement of resistance - determination of temperature coefficient of resistance - Potentiometer - calibration of ammeter - calibration of Voltmeter. **(9 Hours)**

UNIT II: ANALOG ELECTRONICS

Formation of PN junction diode, Biasing, V-I characteristics - Zener diode - Characteristics of Zener diode - Bridge rectifier -Transistor - Working of an n-p-n transistor - CE Configuration -Characteristics of a Transistor (CE mode). **(9 Hours)**

UNIT III: DIGITAL ELECTRONICS

Decimal Number system - Binary Number system - Conversion of binary number into decimal number - Conversion of decimal number into binary number - Binary addition and subtraction. Boolean's algebra - Postulates and theorems of Boolean Algebra -De Morgan's theorems - Logic gates - NOT Gate (Inverter) - OR Gate - AND Gate, NOR Gate - NOR gate is a universal gate - NAND gate is a universal gate - Exclusive OR Gate. **(9 Hours)**

UNIT IV: ATOMIC PHYSICS

Bohr's atom model - Calculation of total energy - Bohr's interpretation of the Hydrogen spectrum - Spectral series of hydrogen atom - Energy level diagram- Atomic excitation - Critical potential- Pauli's exclusion principle - Periodic classification of element. **(9 Hours)**

UNIT V: NUCLEAR PHYSICS

Nuclear properties - Size, mass, density, charge, spin angular momentum, resultant angular momentum, nuclear magnetic dipole moment, electric quadrupole moment, parity of nuclei and isospin quantum number- Nuclear fission - energy released in fission - chain reaction - atom bomb - Nuclear fusion - source of stellar energy. **(9 Hours)**

COURSE BOOKS:

1. R. Murugeshan, Electricity and Electronics, I Edition, Annai Print Park, Madurai, 2016.

   UNIT I: Chapter - 2 (All sections)

   UNIT II: Chapter-4: 4.1- 4.5, 4.7, 4.9 - 4.12.

   UNIT III: Chapter - 5(All sections)

2. R. Murugeshan - Modern Physics, 18th Edition, S. Chand & co, New Delhi, 2016.

   UNIT IV: Chapter 4: 4.3, 4.7- 4.8, 4.15, 4.16

   UNIT V: Chapter 17: 17.3.

   Chapter 22: 22.1, 22.1.1, 22.2, 22.2.1, 22.6, 22.6.1

BOOKS FOR REFERENCE:

1. V.K. Mehta, Principle of Electronics, 7th Revised Edition, S. Chand & Co, New Delhi, 2014.
2. S.B. Patel, Nuclear Physics an Introduction, 3rd Edition, New International Publishers, 2021.

ALLIED PHYSICS - II

OPTICS, SPECTROSCOPY AND RELATIVITY

Semester: IV **Hours: 3**

Code : 23PH4AC4B **Credit: 3**

COURSE OUTCOMES

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the fundamentals of optics, spectroscopy and relativity	PSO - 1	K1
CO - 2	Summarize the concepts of geometrical optics, interaction of light with matter and relativistic approach.	PSO - 1, PSO - 2	K2
CO - 3	Solve the problems on optics, spectroscopy and relativity through the acquired knowledge.	PSO - 3	K3
CO - 4	Differentiate the nature of light in geometrical optics and interaction with an obstacle. Illustrate the postulates of special theory of relativity	PSO - 3, PSO - 4	K4
CO - 5	Assess the nature of light in various medium and the relativistic phenomena in different coordinates	PSO - 5	K5

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

Semester: IV				**ALLIED PHYSICS - II: OPTICS, SPECTROSCOPY AND RELATIVITY**						**Hours: 3**	
Code : 23PH4AC4B										**Credit: 3**	
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	4	2	3	5	2	3	4	3	5	3	2	3.27
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	3	4	3	2	2	5	3.36
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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I: GEOMETRICAL OPTICS

Deviation produced by thin lens - Focal length of two thin lenses in contact - Definition of Cardinal points and Respective planes - Refraction through a thin prism - Dispersion through the prism - Dispersive power - Dispersion without deviation - Aplanatic Lens - Oil immersion objective - Rainbow - Theory of primary rainbow - secondary rainbow. **(9 Hours)**

UNIT II: INTERFERENCE AND DIFFRACTON

Interference - Interference in thin films - Production of colors in thin films - Air wedge - Newton's ring - Determination of wavelength - Jamin's Interferometer, Principle and use - Diffraction - Plane transmission grating (Normal incidence only) - Experiment to determine wavelengths. **(9 Hours)**

UNIT III: POLARIZATION AND FIBRE OPTICS

Polarization of light - Double refraction -Huygen's theory of double refraction in uniaxial crystals - Nicol prisms - QWP and HWP - Optical activity (No theory) - Biot's laws for rotatory polarization - Specific rotatory power - Half shade polarimeter. **(9 Hours)**

UNIT IV: SPECTROSCOPY, QUANTUM THEORY AND PHOTOELECTRICITY

Infrared spectroscopy - Ultraviolet spectroscopy - Planck's quantum theory - Raman effect - Experimental study - Characteristics of Raman lines - Quantum theory of Raman effect - Applications. Photoelectricity - Experimental investigation on the Photoelectric effect - Laws of Photoelectric emission - Einstein's Photoelectric equation -Photoelectric cells - Applications. **(9 Hours)**

UNIT V: RELATIVITY

Frame of reference - Newtonian principle of relativity - Galilean transformation equations -Michelson Morley experiment - Postulates of special theory of relativity - Length contraction - Time dilation - Variation of mass with velocity - Mass Energy equivalence. **(9 Hours)**

COURSE BOOKS:

1. R. Murugeshan, Optics Spectroscopy and Modern Physics, 1st Edition, Annai Print Park, Madurai, 2017.

   UNIT I: Chapter 1: (All sections)

   UNIT II: Chapter 2: (All sections)

   UNIT III: Chapter 3: 3.1 - 3.10

   UNIT IV: Chapter 4 (All sections)

2. R. Murugeshan, Modern Physics, 18th Edition, S. Chand & co, New Delhi, 2016.

   UNIT V: Chapter 1: 1.2 - 1,4, 1.6 - 1.7, 1.9, 1.10, 1.13, 1.14

BOOKS FOR REFERENCE:

1. Brijlal and N. Subramanyam, Textbook of Optics, S. Chand & Co, New Delhi, 2002.
2. R. Murugeshan, Modern Physics, S. Chand & Co, New Delhi, 2005.

ALLIED PHYSICS PRACTICAL - II: ELECTRICITY, ELECTRONICS AND MODERN PHYSICS

Semester: IV **Hours: 2**

Code : 23PH4AP4A **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the integrated circuits and components	PSO - 1	K1
CO - 2	Explain the purpose of ICs and components	PSO - 1, PSO - 2	K2
CO - 3	Construct the logic gates using appropriate ICs	PSO - 3	K3
CO - 4	Examine the results with truth tables	PSO - 3, PSO - 4	K4
CO - 5	Assess the results	PSO - 5	K5

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

Semester: IV				**ALLIED PHYSICS PRACTICAL - II: ELECTRICITY, ELECTRONICS AND MODERN PHYSICS**							**Hours: 2**
Code : 23PH4AP4A											**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	2	4	3	2	3	5	3	3	4	2	3.27
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	3	2	3	5	2	3	3	3	5	3	2	3.09
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	3	5	4	2	5	3	3	3	2	4	5	3.54
Overall Mean Score												**3.54**

Result: The Score for this Course is **3.54** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any 6)

1. Construction of AND, OR, NOT, NAND, NOR gates using IC 74 series.
2. Construction of AND, OR, NOT gates using universal gates.
3. Construction and verification of half adder and half subtractor.
4. Verification of Boolean laws using logic gates.
5. Verification of De-Morgan's theorems.
6. Characteristics of Zener Diode.
7. Calibration of low range voltmeter using potentiometer.
8. Determination of resistance, resistivity, and temperature co-efficient of resistance using Carey Foster's bridge.

ALLIED PHYSICS PRACTICAL - II: OPTICS, SPECTROSCOPY AND ELECTRICITY PRACTICAL

Semester: IV **Hours: 2**

Code : 23PH4AP4B **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the required equipment and its purpose	PSO - 1	K1
CO - 2	Explain the working of the equipment.	PSO - 1, PSO - 2	K2
CO - 3	Focus and demonstrate the experiment through acquired knowledge	PSO - 3	K3
CO - 4	Deduce the result from appropriate formula	PSO - 3, PSO - 4	K4
CO - 5	Assess the result	PSO - 5	K5

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

Semester: IV				ALLIED PHYSICS PRACTICAL - II: OPTICS, SPECTROSCOPY AND ELECTRICITY PRACTICAL							Hours: 2
Code : 23PH4AP4B											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	2	3	3	2	3	5	3	3	3	2	3.09
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	3	2	3	5	2	3	3	3	5	3	2	3.09
CO - 4	3	2	5	5	2	3	3	3	5	5	2	3.45
CO - 5	4	5	2	2	5	5	4	5	2	2	5	3.72
Overall Mean Score												**3.36**

Result: The score for this course is **3.36** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any 6)

1. Determination of thickness of wire using Air wedge.
2. Determination of refractive index of a prism using Spectrometer.
3. Determination of angle of the prism using Spectrometer.
4. Determination of dispersive power of a prism using Spectrometer.
5. Determination of wavelength of the spectrum using Spectrometer - Grating.
6. Determination of radius of curvature using Newton's Rings.
7. Determination of the resonant frequency of the circuit and self-inductance of the coil using LCR - Series Resonance circuits.
8. Determination of the resonant frequency of the circuit and self-inductance of the coil using LCR - Parallel Resonance circuits.

ALLIED: GENERAL CHEMISTRY-II

Semester: IV **Hours: 3**

Code : 23CH4AC4A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire knowledge on the role of chemistry in day-to-day life, electrochemistry, principles of photochemistry, surface chemistry and catalysis	PSO-1	K1
CO - 2	Explain the preparation and properties of some important compounds, the concepts of electrochemistry, principles of photochemistry, surface chemistry and catalysis	PSO-2	K2
CO - 3	Apply the chemistry behind chemical compounds, electrochemical process, the principles of photochemistry in various photophysical processes	PSO-3	K3
CO - 4	Analyse the usage of drugs and quantum yield for the reactions, quality of a catalyst, isotherms and the structure of polymers	PSO-4	K4
CO - 5	Evaluate nature of drugs, chemical structure and uses of important polymers and reactions of surface chemistry	PSO-5	K5

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

Semester: IV				**ALLIED: GENERAL CHEMISTRY-II**							**Hours: 3**
Code : 23CH4AC4A											**Credit: 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	5	3	3	3	3	4	5	3	3	4	3	3.55
CO - 2	3	4	5	5	3	3	3	5	4	3	3	3.72
CO - 3	4	5	3	3	3	3	4	3	5	3	3	3.55
CO - 4	4	3	3	3	4	5	4	3	3	5	4	3.72
CO - 5	3	4	3	3	5	3	3	3	4	3	5	3.55
Overall Mean Score												**3.62**

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

Note:

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

Values Scaling:

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

UNIT I: CHEMISTRY IN THE SERVICE OF MANKIND:

a) Chemotheraphy: 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

b) 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

c) Insecticides and Pesticides: Definition - preparation and uses of DDT and BHC

(9 Hours)

UNIT II: ELECTROCHEMISTRY:

Arrhenius theory of electrolytes - strong electrolytes - weak electrolytes - pH of the solutions: definition and calculation - buffer solutions - applications - 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 - laws of photochemistry: Beer - Lambert's law, Grotthus Drapper law and Stark - Einstein's Law - photophysical processes: Jablonski diagram - 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: 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 and 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:

1. A. Mary Imelda Jayaseeli, M. Kalanithi, C. Mary Anbarasi, S. Pooranalakshmi, Allied Chemistry III and IV, Shanlax publications., Madurai, 1st Edition, 2022.

   Unit I-V

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 M.S. Pathania, Principles of Physical Chemistry, Vishal Publishing Co., 48th Edition, 2023-2024.

ALLIED: GENERAL ASPECTS OF CHEMISTRY-II

Semester: IV **Hours: 3**

Code : 23CH4AC4B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the importance of distribution law and phase rule, radioactivity, coordination chemistry, importance of dyes and heterocyclic compounds	PSO-1	K1
CO - 2	Describe the importance of distribution law and phase rule, radioactivity, coordination chemistry, importance of dyes and heterocyclic compounds	PSO-2	K2
CO - 3	Illustrate distribution law and phase rule, radioactivity and coordination chemistry and importance of dyes and heterocyclic compounds	PSO-3	K3
CO - 4	Analyse the importance of distribution law and phase rule, radioactivity, coordination chemistry, dyes and heterocyclic compounds	PSO-4	K4
CO - 5	Evaluate distribution law and phase rule, radioactivity, coordination chemistry, importance of dyes and heterocyclic compounds	PSO-5	K5

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

Semester: IV				**ALLIED: GENERAL ASPECTS OF CHEMISTRY-II**							**Hours: 3**
Code : 23CH4AC4B											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	3	3	3	4	5	3	3	4	3	3.55
CO - 2	3	4	5	5	3	3	3	5	4	3	3	3.72
CO - 3	4	5	3	3	3	3	4	3	5	3	3	3.55
CO - 4	4	3	3	3	4	5	4	3	3	5	4	3.72
CO - 5	3	4	3	3	5	3	3	3	4	3	5	3.55
Overall Mean Score												**3.62**

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

Note:

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

Values Scaling

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

UNIT I: a) DISTRIBUTION LAW:

Statement and mathematical formulation - experimental verification - conditions under which the law is obeyed - deviation from the law (Statement only) - applications of distribution law

b) LIQUIDS IN LIQUIDS:

Distillation of homogeneous binary liquid mixtures - theory of fractional distillation and azeotropic distillation - partially miscible liquids: variation of solubility with temperature - critical solution (consolute) temperature - lower and upper - influence of impurity on C.S.T and applications - immiscible liquid systems: theory of steam distillation and its applications **(9 Hours)**

UNIT II: NUCLEAR CHEMISTRY AND RADIOACTIVITY:

Nuclear chemistry - nuclear particles - packing fraction - mass defect - binding energy of the nucleus - related problems - binding energy and stability - nuclear fission: atom bomb - nuclear fusion: hydrogen bomb, energy of the sun atmosphere - Radioactivity - rate of radioactive disintegration - units of radioactivity - half-life period - nature of radiations from radioactive elements **(9 Hours)**

UNIT III: a) COORDINATION COMPOUNDS:

Definition - nomenclature - definition of various terms involved in coordination chemistry - Werner's theory - EAN rule - VB theory (outline only) - nickel carbonyl - chelates

b) INDUSTRIAL CARBON:

Manufacture of graphite, carbon black, calcium carbide - silicon carbide **(9 Hours)**

UNIT IV: a) CONDENSED SYSTEM:

Naphthalene and anthracene: isolation from coal tar, synthesis, properties, uses and structures (no elucidation)

b) DYES:

Definition - theory of colour and constitution - classification according to the structure and application - preparation of methyl orange - bismark brown and malachite green **(9 Hours)**

UNIT V: HETEROCYCLIC COMPOUNDS:

Preparation, properties and structures of pyrrole, furan, thiophene, indole, pyridine, pyrazole, imidazole, quinoline and isoquinoline (no structural elucidation) **(9 Hours)**

COURSE BOOKS:

1. B.R.Puri, L.R.Sharma and M.S. Pathania, Principles of Physical Chemistry, Vishal Publishing Co., 48th Edition, 2023-2024. **Unit I-II**
2. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers, 33rd Edition, 2022-2023. **Unit III**
3. M.K. Jain and S.C. Sharma, Modern Organic Chemistry, Vishal Publishing Co., 4th Edition, 2023. **Unit IV-V**

ALLIED PRACTICAL: VOLUMETRIC ANALYSIS

Semester: IV **Hours: 2**

Code : 23CH4AP4A **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 - 1	K1
CO - 2	Describe the skills to do the volumetric titration using double burette method	PSO - 2	K2
CO - 3	Estimate the amount of substance present in the given solution	PSO - 3	K3
CO - 4	Demonstrate the different types of titrations such as acidimetry, alkalimetry and permanganometry	PSO - 4	K4
CO - 5	Develop problem solving skills	PSO - 5	K5

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

Semester: IV				ALLIED PRACTICAL: VOLUMETRIC ANALYSIS							Hours: 2
Code : 23CH4AP4A											Credit: 1
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	4	4	4	3	4	5	4	4	4	3	4.00
CO - 2	3	4	5	5	3	3	3	5	4	3	3	3.73
CO - 3	4	5	4	4	3	3	4	4	5	3	3	3.82
CO - 4	3	3	4	4	4	5	3	4	3	5	4	3.82
CO - 5	3	4	4	4	5	3	3	4	4	3	5	3.82
Overall Mean Score												**3.84**

Result: The score for this course is **3.84** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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 FOLLOWING MICROSCALE METHOD:

Making up of the solution to be estimated and following double burette method for estimation

I. ACIDIMETRY AND ALKALIMETRY

1. Estimation of Na_2CO_3
2. Estimation of NaOH
3. 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 PG and Research Center of Chemistry, Reprint, 2023

ALLIED PRACTICAL: QUANTITATIVE ESTIMATION

Semester: IV **Hours: 2**

Code : 23CH4AP4B **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain analytical skills in volumetric estimation	PSO-1	K1
CO - 2	Explain the principle of EDTA titrations	PSO-2	K2
CO - 3	Apply skills in colorimetric estimation of metal ions	PSO-3	K3
CO - 4	Estimate the hardness of the given sample of water	PSO-4	K4
CO - 5	Adopt safety measures in handling chemicals	PSO-5	K5

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

Semester: IV				**ALLIED PRACTICAL: QUANTITATIVE ESTIMATION**							**Hours: 2**
Code : 23CH4AP4B											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	4	4	4	3	3	5	4	4	3	3	3.82
CO - 2	4	3	5	5	3	3	4	5	3	3	3	3.73
CO - 3	3	5	3	3	4	3	3	3	5	3	4	3.55
CO - 4	3	3	3	3	4	5	3	3	3	5	4	3.55
CO - 5	3	3	3	3	5	4	3	3	3	4	5	3.55
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

I. EDTA TITRATIONS

1. Estimation of Magnesium
2. Estimation of Zinc
3. Estimation of Hardness of water

II. COLORIMETRY

1. Estimation of Iron
2. Estimation of Copper

REFERENCE BOOK:

1. V.Venkateswaran, R. Veeraswamy and A. R. Kulandaivelu, Basic Principles of Practical Chemistry, Sultan Chand and Sons, Reprint 2023.

OFFICE FUNDAMENTALS

Semester: IV **Hours: 3**

Code : 23SE4OA4B **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge to handle the tools of MS office	PSO-3	K1
CO - 2	Understand the basics to create animations, presentations and documents	PSO-4	K2
CO - 3	Analyse the data using spreadsheets in MS Excel for various applications.	PSO-1	K3
CO - 4	Develop computational skills	PSO-2	K4
CO - 5	Use DTP skills to become an entrepreneur.	PSO-5	K5

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

Semester: IV				OFFICE FUNDAMENTALS								Hours: 3
Code : 23SE4OA4B												Credit: 2
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 2	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 3	5	4	3	3	3	3	5	3	3	3	4	3.55
CO - 4	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 5	3	5	3	3	3	3	3	3	3	3	5	3.36
Overall Mean Score												3.40

Result: The score for this course is **3.40** (High Relationship)

Note:

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

Values Scaling:

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

UNITI

MS Word: Formatting- Table Creation - Preparation of advertisement using drawing tool- Invitation card preparation. **(9 Hours)**

UNIT II

MS Excel: Excel Function (statistical) - Data filtering and sorting - Mark sheet, pay bill Preparation - Data analysis using chart. **(9 Hours)**

UNIT III

MS Access: Database Creation & Mark Sheet Preparation- Forms and Reports. Creation. **(9 Hours)**

UNIT IV

MS Power point: Theme - based presentation with Animation Effects.

(9 Hours)

UNITV

MS Outlook: Personalized Email and Account creation, sending mails with attachments and money transaction. **(9 Hours)**

COURSE BOOK:

- Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. D. P. Nagpal, Computer Fundamentals, S. Chand & Company Ltd., New Delhi, 1999.
2. V. Rajaraman, Fundamentals of Computers, 3rdEdition, Prentice Hall of India Pvt. Ltd., 2001.
3. B. Ram, Computer Fundamentals, 3rdEdition, New Age International Pvt. Ltd., 2010.

E- RESOURCE:

1. https://onlinecourses.swayam2.ac.in/cec19_mg35/preview

ASTROPHYSICS

Semester: IV **Hours: 2**

Code : 23PH4GE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Define the terminologies in the study of space	PSO - 1	K1
CO-2	Explain the properties of earth, moon, sun and stars	PSO - 2, PSO - 3	K2
CO-3	Illustrate the activities that occur in celestial bodies	PSO - 3	K3
CO-4	Classify the processes and stages involved in the formation of the Universe	PSO - 4	K4
CO-5	Deduce the correlation between the theories involved in the evolution of Universe	PSO - 2	K5

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

Semester: IV				**# ASTROPHYSICS**							**Hours: 2**
Code : 23PH4GE02											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	3	3	4	3	4	5	4	4	3	3	3.72
CO-2	4	2	2	5	2	5	4	5	5	2	2	3.45
CO-3	3	4	4	5	4	3	3	3	5	4	4	3.81
CO-4	4	3	3	3	3	4	4	4	3	3	3	3.36
CO-5	4	5	3	2	5	5	4	5	2	3	5	3.91
Overall Mean Score												**3.65**

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

Note:

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

Values Scaling:

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

UNIT I: 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 - Colours 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 - Colour magnitude diagrams - Neutron stars - Black holes - Galaxies (Summary only). **(6 Hours)**

COURSE BOOKS:

- 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.
2. William J. Kaufmann, III Universe (Fourth Edition), W. H. Freeman and Company, New York, 1994.
3. S. Kumaravelu and Suseela Kumaravelu, Astrophysics, Shree Vishnu Arts, Sivakasi, 2004.
4. Nicholas A. Pananides and Thomas Arny, Introductory Astronomy (Second Edition), Addison, Wesley Publishing Company, USA,1973.

GE-2: ORGANIZATION AND HEALTH PROGRAMME IN NCC

Semester: IV **Hours: 2**

Code : 23GE4NC02 **Credit: 2**

COURSE OUTCOMES:

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

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

Semester: IV				GE-2:ORGANIZATION AND HEALTH PROGRAMME IN NCC							Hours: 2
Code : 23GE4NC02											Credits: 2
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	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 = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

GE-2: ORGANIZATION AND HEALTH PROGRAMME IN NCC

2hrs/Week

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

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

UNIT II: Map Reading **6 Hours**

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

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

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

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

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

UNIT V: First Aid **6 Hours**

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

BOOKS FOR REFERENCES:

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

ABILITY ENHANCEMENT COURSE-4 (AEC-4)

CAPACITY BUILDING

Semester: IV **Hours: 1**

Code : 23AE4CB04 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the importance of capacity building	PSO-1	K1
CO - 2	Develop skills for life-long learning	PSO-2,4	K2
CO - 3	Asses the importance of organizational development	PSO-3	K3
CO - 4	Analyze the need of the community togetherness	PSO-4	K4
CO - 5	Evaluate tech-based learning experiences.	PSO-5	K5

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

Semester: IV				**CAPACITY BUILDING**							**Hours: 1**
Code : 23AE4CB04											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of 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: 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

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

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

BOOKS FOR REFERENCE:

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

Continuous Internal Assessment Component (CIA)

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

ATOMIC PHYSICS AND LASERS

Semester: V **Hours: 6**

Code : 23PH5MC07 **Credit: 5**

COURSE OUTCOMES:

CO NO.	UPON COMPLETION OF THIS COURSE, THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	State the laws governing the structure of atom, photoelectric emission and production of laser	PSO - 1, PSO - 2	K1
CO-2	Explain the properties of atomic particles and underlying principles of the interaction of light with matter	PSO - 1, PSO - 2	K2
CO-3	Illustrate various experiments in the study of charged particles, critical potentials, photoelectric effect and lasers	PSO - 1, PSO -2, PSO - 3	K3
CO-4	Classify various mass spectrographs, atom models, splitting effects and types of lasers	PSO - 3, PSO - 4	K4
CO-5	Summarize the applications of Atomic Physics and Lasers in real time situations	PSO - 4, PSO - 5	K5

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

Semester: V				**ATOMIC PHYSICS AND LASERS**							**Hours: 6**
Code : 23PH5MC07											**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	2	3	2	5	5	5	3	2	2	3.27
CO - 2	5	2	3	3	2	5	5	5	3	3	2	3.45
CO - 3	5	2	2	5	2	5	5	5	5	2	2	3.63
CO - 4	4	2	5	5	2	4	4	4	5	5	2	3.81
CO - 5	4	5	5	2	5	3	4	3	2	5	5	3.90
Overall Mean Score												**3.61**

Result: The score for this course is **3.61** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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 ELECTRON AND POSITIVE RAYS

Determination of the Electronic Charge by Millikan's oil drop method - Determination of e/m by Dunnington's method - Discovery and Properties of Positive Rays - Positive Ray analysis by Thomson's parabola method - Aston's mass spectrograph - Bainbridge's mass spectrograph - Dempster's mass spectrograph - Mass defect and Packing fraction - Separation of Isotopes. **(18 Hours)**

UNIT II: ATOMIC STRUCTURE

Rutherford's experiments on scattering of α-particles - Bohr atom model - Critical potentials - Atomic excitation - Experimental determination of critical potentials - Drawbacks of Bohr atom model - Sommerfeld's relativistic atom model - Vector atom model - Quantum numbers associated with vector atom model - Coupling schemes. **(18 Hours)**

UNIT III: SPLITTING OF SPECTRAL LINES

Pauli's exclusion principle - Periodic classification of elements - Magnetic dipole moment - Stern and Gerlach experiment - Optical spectra - Fine structure of Hα line - Zeeman effect - Larmor's theorem - Quantum mechanical explanation of Normal Zeeman effect - Anomalous Zeeman effect - Paschen-Back effect - Stark effect.

(18 Hours)

UNIT IV: PHOTOELECTRIC EFFECT

Lenard's method to determine e/m for Photoelectrons - Richardson and Compton experiment - Experimental investigations on the Photoelectric effect - Laws of photoelectric emission - Einstein's Photoelectric equation - Photoelectric cells: Photo emissive cell, Photovoltaic cell, Photoconductive cell - Applications of Photoelectric cells. **(18 Hours)**

UNIT V: LASERS

Interaction of light with matter: Absorption - Spontaneous emission - Stimulated emission - Einstein co-efficient and their relations - Light amplification - Population inversion - Metastable states - Confining radiation within the medium - Components of laser: Active medium - Pump - Optical resonant cavity - Lasing action - Types of lasers: Ruby laser - Helium-Neon laser - Semiconductor laser - Laser beam characteristics - Applications. **(18 Hours)**

COURSE BOOKS:

1. R. Murugeshan and Kiruthiga Sivaprasath, Modern Physics, 18th edition, S. Chand and Company Limited, New Delhi, Reprint 2022.

   UNIT I : Chapter 2: 2.1, 2.2, Chapter 3: 3.1 to 3.8

   UNIT II : Chapter 4: 4.1, 4.3, 4.7 to 4.14

   UNIT III : Chapter 4: 4.15 to 4.28

   UNIT IV : Chapter 6: 6.1 to 6.6

2. N. Subrahmanyam, Brijlal and M. N. Avadhanulu, Textbook of Optics, 25th Edition, S. Chand and Company Limited, New Delhi, Reprint 2018.

   UNIT V **:** Chapter 22: 22.1, 22.4 to 22.9, 22.14.3, 22.15 to 22.17

BOOKS FOR REFERENCE:

1. N. Subrahmanyam, Brijlal and Jivan Seshan, Atomic and Nuclear Physics, S. Chand & Company Limited, New Delhi, 2008.
2. J. B. Rajam, Modern Physics, S. Chand & Company Limited, New Delhi, 1957.
3. N. K. Sehgal, K. L. Chopra and D. L. Sehgal, Modern Physics, Sultan Chand & Sons, New Delhi, 2004.
4. M. N. Avadhanulu, An Introduction to Lasers-Theory and Applications, Second Revised Edition, S. Chand & Company Limited, New Delhi, 2012.
5. Arthur Beiser, Perspective of Modern Physics, McGraw Hill Book Company, 1969.
6. S. Ramamoorthy, A Textbook of Modern Physics, National Publishing House, Delhi, 1965.
7. B. B. Laud, Laser and Non-linear Optics, New Age International Publishers, New Delhi, 2011.

MODERN PHYSICS

Semester: V **Hours: 6**

Code : 23PH5MC08 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Describe the basic laws in relativity, classical, quantum, wave and statistical physics	PSO-1	K1
CO-2	Comprehend the fundamental principles of various mechanics relevant to problems of physics	PSO-2, PSO-3	K2
CO-3	Apply theoretical physics concepts to address challenges in real physical problems	PSO-3, PSO-4	K3
CO-4	Analyze and evaluate theoretical models, hypotheses and experimental evidence within the realm of theoretical physics	PSO- 4	K4
CO-5	Develop creativity in approaching complex theories to break the boundaries of theoretical physics	PSO-5	K5

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

Semester: V				**MODERN PHYSICS**							**Hours: 6**
Code : 23PH5MC08											**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	3	4	4	3	4	5	4	4	4	3	3.9
CO-2	4	3	3	5	3	5	4	5	5	3	3	3.9
CO-3	4	3	5	5	3	4	4	4	5	5	3	4.09
CO-4	4	4	5	4	4	4	4	4	4	5	4	4.18
CO-5	4	5	4	3	5	4	4	4	3	4	5	4.09
Overall Mean Score												**4.03**

Result: The score for this course is **4.03** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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: 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. **(18 Hours)**

UNIT II: CLASSICAL MECHANICS

Conservative Forces - Degrees of Freedom - Constraints - Generalized 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. **(18 Hours)**

UNIT III: WAVE MECHANICS

Inadequacy of Classical Mechanics - Expression for Group Velocity - Experimental study of Matter Waves -Electron Microscope - 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. **(18 Hours)**

UNIT IV: QUANTUM MECHANICS

Postulates of Quantum Mechanics - Operators in Quantum Mechanics-Operator for Momentum - Operator for Kinetic Energy - Operator for Total Energy - Orbital Angular Momentum Operator (Definition) - Commuting operators - Simultaneous Eigen functions - Simultaneous Measurability of Observables - Commutator Algebra - Hermitian Operator- Parity Operator- Probability Density- Probability current density - Wave packet - Ehrenfest's Theorem. **(18 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. **(18 Hours)**

COURSE BOOKS:

- R. Murugeshan and Kiruthiga Sivaprasath - Modern Physics, 18th edition - S. Chand & Co., New Delhi - 2019.

  UNIT I: Chapter 1: All sections

  UNIT II: Chapter 42: 42.1- 42.10

  UNIT III: Chapter 7: 7.1-7.5, Chapter8: 8.1-8.3, 8.9

  UNIT IV: Chapter 10: 10.1 (10.1.1-10.1.5), 10.2 (10.2.1-10.2.7), 10.3 (10.3.1)

  UNIT V: Chapter 43: 43.1-43.9

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.
3. R. Murugeshan and Kiruthiga Sivaprasath - Modern Physics, 17th edition, S. Chand & Co., New Delhi, 2018.
4. R. Murugeshan, Modern Physics, 11th revised edition, S. Chand & Co., New Delhi, 2003.

MAJOR PRACTICAL - IV

Semester: V **Hours: 5**

Code : 23PH5CP04 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Examine the characteristics of electronic devices.	PSO - 1	K1
CO-2	Demonstrate the performance of the electric circuits under different input-output conditions.	PSO - 1, PSO - 2	K2
CO-3	Build amplifiers, oscillators, filters, clippers, and clamper circuits and study their behavior.	PSO - 3	K3
CO-4	Categorize the circuits for different electrical applications	PSO - 3, PSO - 4	K4
CO-5	Design linear circuits with desired parameters.	PSO - 5	K5

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

Semester: V				**MAJOR PRACTICAL - IV**							**Hours: 5**
Code : 23PH5CP04											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	2	3	3	2	4	5	4	3	3	2	3.27
CO-2	5	2	3	3	2	4	5	4	3	3	2	3.27
CO-3	4	2	3	5	2	4	4	4	5	3	2	3.45
CO-4	3	2	5	4	2	3	3	3	4	5	2	3.27
CO-5	4	4	4	3	4	3	4	3	3	4	4	3.63
Overall Mean Score												**3.38**

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

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any eight)

1. Characteristics of Zener diode.
2. Characteristics of Transistor - CE mode.
3. Characteristics of Transistor - CB mode.
4. Construction of the Bridge Rectifier & LC and π filters.
5. Construction of Low pass, High pass and Band pass filters.
6. Construction of the Hartley Oscillator and to study its frequency response.
7. Construction of the Colpitts's Oscillator and to study its frequency response.
8. Construction of Single Stage Amplifier and its frequency response - CE mode.
9. Construction of Two Stage Amplifier with and without feedback.
10. Wave shaping properties of Clipper and Clamper circuits.
11. Determination of the e/m value using Thomson method
12. Figure of merit and charge sensitivity of the coil using Ballistic Galvanometer
13. Resistance and resistivity of a coil using Potentiometer.

MAJOR PRACTICAL - V

Semester: V **Hours: 5**

Code : 23PH5CP05 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain the working of the Logic gates, multi vibrators and Op Amp	PSO - 1	K1
CO-2	Demonstrate the performance of the logic and electronic circuits	PSO - 1, PSO - 2	K2
CO-3	Build Logic gates, multi vibrators and Op Amp circuits	PSO - 3	K3
CO-4	Deduce the results from circuits and verify the truth tables	PSO - 3, PSO - 4	K4
CO-5	Assess the results with the standard values	PSO - 5	K5

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

Semester: V				**MAJOR PRACTICAL - V**							**Hours: 5**
Code : 23PH5CP04											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	2	3	3	2	4	5	4	3	3	2	3.27
CO-2	5	2	3	3	2	4	5	4	3	3	2	3.27
CO-3	4	2	3	5	2	4	4	4	5	3	2	3.45
CO-4	3	2	5	4	2	3	3	3	4	5	2	3.27
CO-5	4	4	4	3	4	3	4	3	3	4	4	3.63
Overall Mean Score												**3.38**

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

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any eight)

1. Construction and verification of truth tables for AND, OR, NOT, XOR gates using discrete components
2. Verification of truth tables for AND, OR, NOT, NAND, NOR, XOR gates using IC 74 Series
3. Construction and verification of truth tables for NAND, NOR gates using discrete components
4. Construction of AND, OR, NOT gates using NAND, NOR Gates as Universal Gates
5. Construction and verification of truth tables of Bistable multivibrator using discrete components
6. Construction of Astable multivibrator using discrete components and verification of frequency
7. Characteristics of Op-Amp.
8. Applications of Op-Amp as an Adder and Subtractor.
9. Construction of Dual Power Supply using IC's

MATHEMATICAL PHYSICS

Semester: V **Hours: 4**

Code : 23PH5DE1A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Define various mathematical methods and tools	PSO - 1, PSO - 2	K1
CO-2	Demonstrate the ideas of vectors, theory of matrices, vector calculus, Fourier series and differential equations.	PSO - 1, PSO - 2, PSO - 4	K2
CO-3	Solve mathematical problems arising in physics by various mathematical technique	PSO - 3, PSO - 4	K3
CO-4	Analyze mathematical problems using the relevant formulae and theorems.	PSO - 3, PSO - 5	K4
CO-5	Model and solve real-world problems mathematically in a wide range of areas	PSO - 4, PSO - 5	K5

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

Semester: V				**MATHEMATICAL PHYSICS**							**Hours: 4**
Code : 23PH5DE1A											**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	2	3	4	2	5	5	5	4	3	2	3.63
CO-2	5	3	5	4	3	5	5	5	4	5	3	4.27
CO-3	3	3	5	5	3	3	3	3	5	5	3	3.72
CO-4	3	3	4	5	3	3	3	3	5	4	3	3.54
CO-5	3	5	5	4	5	3	3	3	4	5	5	4.09
Overall Mean Score												**3.85**

Result: The score for this course is **3.85** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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: VECTOR CALCULUS

Gradient of a scalar Field- Line, Surface and Volume Integrals- Divergence of a vector function- Curl of a vector function and its physical significance- important vector identities- Gauss Divergence Theorem- Stoke's Theorem- Greens Theorem. **(12 Hours)**

UNIT II: ORTHOGONAL CURVILINEAR COORDINATES

Orthogonal Curvilinear Coordinates- differential operators in terms of orthogonal curvilinear coordinates-Spherical Polar coordinates and differential operators- cylindrical coordinates and differential operators- Unit vectors in Cylindrical and spherical coordinates **(12 Hours)**

UNIT III: MATRICES

Types - Transpose - Conjugate - Symmetric and antisymmetric - Hermitian and Skew Hermitian - Determinant - Cofactors - Minors - Singular and nonsingular - Adjoint - Inverse - Orthogonal - Unitary - Trace - Eigen Values and Eigen Vectors- Cayley Hamilton Theorem **(12 Hours)**

UNIT IV: 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. **(12 Hours)**

UNIT V: APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS (PDE)

Solution of PDE by the method of separation of variables - Solution of Laplace Equations in Cartesian Coordinates- Solution of Laplace equation in two dimensional cylindrical coordinates: circular Harmonics, Solution of Laplace equation in general cylindrical coordinates: general cylindrical Harmonics- Solution of Laplace equation in Spherical polar coordinates: Spherical Harmonics - Diffusion equation/ heat flow - solution of heat flow equation : method of separation of variables **(12 Hours)**

COURSE BOOKS:

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

  UNIT I: Chapter 1: 1.2-1.7, 1.9, 1.11

  UNIT II: Chapter 1: 1.15- 1.16

  UNIT III: Chapter 2: 2.5-2.19, 2.31, 2.3

  UNIT IV: Chapter 8: 8.1 - 8.9 (1 & 2).

  UNIT V: Chapter 9: 9.1-9.8

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 2012

NUMERICAL METHODS AND C PROGRAMMING

Semester: V **Hours: 4**

Code : 23PH5DE1B **Credit: 3**

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 equations and describe the basics of C programming	PSO - 1, PSO - 2	K1
CO - 2	Derive the formulae for various numerical methods and explain the special features of a C program	PSO - 2, PSO - 3	K2
CO - 3	Apply the working rules of numerical methods for solving equations and illustrate the organization of a C program	PSO - 2, PSO - 3	K3
CO - 4	Analyze the results of numerical methods and the respective C program	PSO - 3, PSO - 4	K4
CO - 5	Formulate various steps of numerical methods and develop C programs for real life problems	PSO - 4, PSO - 5	K5

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

Semester: V				NUMERICAL METHODS AND C PROGRAMMING								Hours: 4
Code : 23PH5DE1B												Credit: 3
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	2	3	4	2	5	5	5	4	3	2	3.63
CO - 2	4	3	3	5	3	5	4	5	5	3	3	3.90
CO - 3	3	3	5	5	3	3	3	3	5	5	3	3.72
CO - 4	3	5	5	3	5	2	3	2	3	5	5	3.72
CO - 5	4	3	4	5	3	4	4	4	5	4	3	3.90
Overall Mean Score												3.78

Result: The score for this course is **3.78** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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: NUMERICAL SOLUTIONS

Errors in Numerical Computation: Absolute error - Relative error - Experimental error - Bisection method - Regula- Falsi method - Newton-Raphson method - Geometrical interpretation. **(12 Hours)**

UNIT II: NUMERICAL DIFFERENTIATION AND INTEGRATION

Numerical differentiation: Newton's forward and backward difference formula - Maxima and minima of the interpolating polynomial - Numerical integration: Newton Cote's quadrature formula - Trapezoidal rule - Simpson's one third rule - Simpson's three eight rule. **(12 Hours)**

UNIT III: CURVE FITTING AND INTERPOLATION

Curve fitting: Linear law - Method of group averages - Method of moments - Method of least squares - Interpolation: Interpolation with equal intervals - Newton's forward and backward interpolation formulae - Interpolation with unequal intervals - Lagrange's interpolation formula. **(12 Hours)**

UNIT IV: INTRODUCTION TO C

Character set - C tokens: Keywords and identifiers - Constant - Variables - Data types - Declaration of variables - Declaration of storage class - Assigning values to variables - Defining symbolic constants - Declaring a variable as constant and as volatile - Operators: Arithmetic - Relational - Logical - Assignment - Increment and decrement - Conditional - Bitwise - Special operators - Arithmetic expressions. **(12 Hours)**

UNIT V: CONTROL STRUCTURE

Decision making with If statement - Simple if statement - If-else statement - Nested If-else statement - else-if ladder - Switch statement -? operator - Goto statement - While statement - Do statement - For statement Jump in loops - One dimensional array - Declaration and Initialization - Two dimensional arrays - Declaration and Initialization - Simple Programs. **(12 Hours)**

COURSE BOOKS:

1. S. Arumugam, A. Thangapandian Isaac and A. Somasundaram, Numerical Methods, Second Edition, SciTech Publications (India) Pvt. Ltd, Chennai, Reprint 2012.

   UNIT I : Chapter 3: 3.0, 3.2 to 3.5

   UNIT II : Chapter 8: 8.0 to 8.2, 8.5

   UNIT III : Chapter 2: 2.0 to 2.4, Chapter 7: 7.0, 7.1, 7.3

2. E. Balagurusamy, Programming in ANSI C, Seventh Edition, McGraw Hill Education (India) Private Limited, Chennai, 2017.

   UNIT IV : Chapter 2: Pages 22 to 44, Chapter 3: Pages 52 to 64

   UNIT V : Chapter 5: Pages 112 to 135, Chapter 6: Pages 151 to 169, Chapter 7: Pages 191 to 212

BOOKS FOR REFERENCE:

1. A. Singaravelu, Numerical methods, Meenakshi publication, 4th Edn., 1999.
2. P. Kandasamy, K. Thilagavathy, K. Gunavathi - Numerical methods, S. Chand, 2016.
3. M. K. Venkatraman, Numerical Analysis, NPH, 2013.
4. B. D. Gupta, Numerical Analysis, Konark Publishers, New Delhi, 2013.
5. C. Byron & S. Gottfried, Schaum's outline series, Theory and Problems of programming in C, Tata McGraw Hill, 2003.
6. T. Veerarajan and T. Ramachandran, Numerical methods: With Programs in C, Second Edition, McGraw Hill Education, India, 2005.
7. S. Ramaswamy and P. Radhaganesan, Programming in C, Second Edition, SciTech Publications (India) Pvt. Ltd, 2012.

MATERIALS SCIENCE

Semester: V **Hours: 4**

Code : 23PH5DE1C **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Describe the characteristics of dielectric, magnetic, semiconducting, superconducting and new generation materials	PSO - 1, PSO - 2	K1
CO-2	Explain the properties of various types of materials	PSO -1, PSO - 2	K2
CO-3	Identify the special features of the materials and apply them in daily life	PSO - 3, PSO - 4	K3
CO-4	Compare and relate different kinds of materials based on their unique nature.	PSO - 4	K4
CO-5	Justify and interpret the selection of materials for future applications	PSO - 4, PSO - 5	K5

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

Semester: V				MATERIALS SCIENCE								Hours: 4
Code : 23PH5DE1C												Credit: 3
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO-1	5	3	4	3	3	4	5	4	3	4	3	3.72
CO-2	4	3	4	3	3	5	4	5	3	4	3	3.72
CO-3	3	4	4	5	4	4	3	4	5	4	4	4
CO-4	3	3	5	4	3	3	3	3	4	5	3	3.54
CO-5	3	5	4	3	5	3	3	3	3	4	5	3.72
Overall Mean Score												3.74

Result: The score for this course is **3.74** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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 - Mosotti 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: SUPERCONDUCTING MATERIALS

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

UNIT IV: 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 V: NEW MATERIALS

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

COURSE BOOKS:

1. 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 8: All sections
   UNIT IV: Chapter 9: 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, 18 th Revised Edition, Chand & Co, New Delhi, 2013.
2. Charles Kittel - Solid State Physics, 7th Edition, Wiley India Pvt. Limited, 1998

ANALOG ELECTRONICS

Semester: V **Hours: 4**

Code : 23PH5DE2A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Tabulate the bipolar and tripolar semiconductor devices and their applications.	PSO - 1	K1
CO-2	Summarize the operations of solid-state devices.	PSO - 1, PSO - 2	K2
CO-3	Build analog electronic circuits, such as amplifiers and oscillators.	PSO - 3	K3
CO-4	Categorize circuits for D.C and A.C applications using transistor, FET and SCR.	PSO - 3, PSO - 4	K4
CO-5	Evaluate the parameters of diodes, transistors and FET.	PSO - 5	K5

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

Semester: V				**ANALOG ELECTRONICS**							**Hours: 4**
Code : 23PH5DE2A											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	2	3	3	2	4	5	4	3	3	2	3.27
CO-2	4	2	3	3	2	5	4	5	3	3	2	3.27
CO-3	4	2	3	5	2	4	4	4	5	3	2	3.45
CO-4	3	3	5	4	3	4	3	4	4	5	3	3.72
CO-5	3	5	3	3	5	3	3	3	3	3	5	3.54
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: SEMICONDUCTOR PHYSICS

Semiconductor-Bonds in Semiconductors- Intrinsic semiconductor- Extrinsic semiconductor-n-type Semiconductor-p-type Semiconductor -Majority and Minority carriers-pn junction-Properties of pn-junction - Biasing a pn junction-Current flow in a forward biased pn-junction. Volt - Ampere Characteristics of pn junction- Half wave Rectifier-Efficiency of Half- wave Rectifier-Full-wave Rectifier - Full-wave Bridge Rectifier- Efficiency of Full-wave Rectifier. **(12 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. **(12 Hours)**

UNIT III: AMPLIFIERS

Single stage amplifier - Transistor amplification - 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. **(12 Hours)**

UNIT IV: OSCILLATORS

Positive feedback amplifier - Oscillator - Explanation of Barkhausen criterion - Different types of transistor oscillator - Colpitt oscillator - Hartley oscillator - Phase Shift oscillators - Crystal oscillator. **(12 Hours)**

UNIT V: POWER ELECTRONICS

Types of field effect transistor - JFET - Principle and working - Symbol - importance - differences - JFET as an amplifier - Characteristics - Advantages - Parameters - Relation between parameters - Variation of gm - 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. **(12 Hours)**

COURSE BOOK:

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

  UNIT I: Chapter 5: 5.1, 5.2, 5.5, 5.8 - 5.11, 5.13 - 5.18. Chapter 9: 9.8, 9.9, 9.10, 9.12, 9.13

  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

  UNIT IV: Chapter 14: 14.5-14.13, 14.20.

  UNIT V: 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.

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.

MEDICAL INSTRUMENTATION

Semester: V **Hours: 4**
Code : 23PH5DE2B **Credit: 3**
COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THE COURSE THE STUDENT WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Identify the physical problems encountered in living systems	PSO -1, PSO -3	K1
CO-2	Summarize the merits and demerits of the instruments used for medical applications	PSO - 2, PSO - 4	K2
CO-3	Classify the various medical instrumentation techniques	PSO - 2, PSO - 3	K3
CO-4	Analyze various imaging and radio graphical reports	PSO - 4, PSO - 5	K4
CO-5	Imbibe medical instrumentation technologies through theoretical & practical learning.	PSO - 5	K5

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

Semester: V											**Hours: 4**
Code : 23PH5DE2B				**MEDICAL INSTRUMENTATION**							**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	5	2	3	5	3	5	3	2	3.45
CO - 2	3	2	4	3	2	5	3	5	3	4	2	3.27
CO - 3	3	2	3	5	2	4	3	4	5	3	2	3.27
CO - 4	3	4	5	3	4	3	3	3	3	5	4	3.63
CO - 5	3	5	4	4	5	3	3	3	4	4	5	3.90
Overall Mean Score												**3.50**

Result: The score for this course is **3.50** (High Relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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: BIOMETRICS, BIOELECTRIC POTENTIALS AND ELECTRODES:

Introduction to man-instrument system and its components - Problems encountered in measuring living systems - Transducers - Force, motion, pressure transducers - Biomedical signals - Sources of bioelectric potentials - Resting, action and propagation of bioelectric potentials - Bio-potential electrodes - Skin surface - Needle electrodes. **(12 Hours)**

UNIT II: BIOMEDICAL RECORDERS:

Electro-conduction system of heart - electro cardiogram (ECG) - Einthoven's triangle - electro encephalogram (EEG) -brain waves - EEG instrumentation - recording of evoked potentials - electro myogram (EMG)-pulse oximeter.

(12 Hours)

UNIT III: COMPUTED TOMOGRAPHY AND RADIOISOTOPES

Computed tomography - Basic principle - Contrast scale - System components - Scanning system - Processing system - Viewing system - Storing and documentation - Radio Isotopes in medical diagnosis - Physics of radioactivity - Radiation detectors - The Gamma camera - Positron Emission Tomography.

(12 Hours)

UNIT IV: MAGNETIC RESONANCE IMAGING

Principles of NMR imaging systems - Fourier transformation of the FID - The Bloch equation - Image reconstruction techniques - Types of Imaging sequences - Basic NMR Components - Biological effects of NMR imaging - Advantages of NMR Imaging system. **(12 Hours)**

UNIT V: ULTRASOUND IMAGING SYSTEMS

Diagnostic ultrasound - Physics of ultrasound waves - Characteristic Impedance - Wavelength and Frequency - Velocity of Propagation - Absorption of ultrasonic energy - Beam width - Resolution - Generation and detection of ultrasound - Medical ultrasound - Basic pulse -echo apparatus - A- Scan - Application of A - Scan - Real time ultrasonic imaging systems **(12 Hours)**

COURSE BOOKS:

1. Leslie Cromwell, Fred Weibel, Erich Pfieffer, Biomedical Instrumentation & Measurements, Prentice Hall of India, New Delhi, 2002.

   UNIT I: Chapter 1: 1.1 - 1.5, 1.7, Chapter 2: 2.1, 2.4**,** Chapter 3: All Sections, Chapter 4: 4.2

2. R. S. Khandpur, Handbook of Biomedical Instrumentation, 2nd Edition, Tata McGraw Hill, New Delhi, 2003.

   UNIT II: Chapter 5: 5.1, 5.4, 5.5

   UNIT III: Chapter 20: 20.1, 20.2, Chapter 21: 21.1, 21.2, 21.3, 21.7, 21.11

   UNIT IV: Chapter 22: All sections

   UNIT V: Chapter 23: 23.1- 23.5, 23.8

BOOKS FOR REFERENCE:

1. Kuppusamy Thayalan, Basic Radiological Physics 2nd Edition. Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, 2017.
2. John Webster, Bio-instrumentation John Wiley and Sons, Singapore, 2004.
3. John Enderle, Susan Blanchard, Joseph Bronzino, Introduction to Biomedical Engineering, 2nd Edition, Elsevier, San Deigo, 2005.
4. William Hendee, Geoffrey Ibbott, Eric Hendee, Radiation therapy Physics 3rd Edition, Wiley-Liss, New Jersey, 2005.

NANOSCIENCE

Semester: V **Hours: 4**

Code : 23PH5DE2C **Credit: 3**

COURSE OUTCOMES:

CO NO	UPON COMPLETION OF THE COURSE THE STUDENT WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain the importance of nanomaterials	PSO - 1, PSO - 2	K1
CO-2	Distinguish the properties, characteristics and fabrication methods of the nanomaterials	PSO - 2, PSO - 4	K2
CO-3	Classify the various nanomaterials and their characterization techniques for different application.	PSO - 1, PSO - 3	K3
CO-4	Analyze the specific features of the nanomaterials for future application	PSO - 4	K4
CO-5	Summarize the features of nanoparticles and to explore the materials towards R & D.	PSO - 1, PSO - 5	K5

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

Semester: V				NANOSCIENCE							Hours: 4
Code : 23PH5DE2C											Credit: 3
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	2	3	3	2	4	5	4	3	3	2	3.27
CO - 2	3	2	4	3	2	5	3	5	3	4	2	3.27
CO - 3	3	2	3	5	2	4	3	4	5	3	2	3.27
CO - 4	3	2	5	3	2	4	3	4	3	5	2	3.27
CO - 5	4	5	3	2	5	3	4	3	2	3	5	3.54
Overall Mean Score												3.32

Result: The score for this course is **3.32** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: NANOSCIENCE AND NANOTECHNOLOGY

Solid materials and their strength - Perspective of length - Nanoscience and nanotechnology - Nanostructures in nature - Nanostructures in nature - Quantum structures - Quantum confinement - Surface effect of nanomaterials - Prime materials - carbon nanostructures - Fullerene - SWCNT and MWCNT - Oxides (metal and metal oxide) - Future of nanotechnology **(12 Hours)**

UNIT II: PROPERTIES OF NANOMATERIALS

Mechanical behavior - Mechanical Properties - Elastic properties - Hardness and strength - Ductility and toughness - Superplastic behavior - Optical properties - Surface plasmon resonance - Quantum size effects - Applications of optical properties of nanomaterials - Electrical properties - Dielectric materials and properties - Magnetic properties - Super Paramagnetism - Electrochemical properties - Chemical sensing properties. **(12 Hours)**

UNIT III: FABRICATION METHODS AND VACUUM TECHNIQUES

Top-down and bottom-up approaches - Lithography Process and its limitations - Nonlithographic techniques Plasma Arc discharge - Sputtering- Evaporation - Thermal evaporation and e-beam evaporation - Chemical vapor depositions (CVD) - Types of CVD Process - Pulsed laser deposition - Molecular beam epitaxy - Sol-gel technique - Electrodeposition method - Ball milling. **(12 Hours)**

UNIT IV: CHARACTERIZATION TECHNIQUES

X-ray crystallography - Structure of Nanomaterials -X-ray Diffraction (XRD) - Rotating crystal method - The powder method - Determination of grain size/ crystallite size / crystallite size distribution - X-ray Diffraction pattern and analysis of some commercially important oxides - Scanning probe microscopy - Scanning tunneling microscopy - General concept and defining characteristics of Atomic Force Microscopy - Electron Microscopy - Scanning electron microscopy - Transmission electron microscopy **(12 Hours)**

UNIT V: APPLICATIONS OF NANOMATERIALS

Nanomaterials in Medicine - Longer lasting medical implants- Nanomaterials in energy sector -High energy density batteries - Next generation computer technology - Phosphorous for high-definition TV - Low-cost flat panel displays - Nanomaterials in Catalysis - water purification - communication sector - Food - Fabric industry - Environment - Automobiles - Ceramic industry - veterinary applications **(12 Hours)**

COURSE BOOKS:

1. M.A. Shah, Tokeer Ahmad, Principles of Nanoscience and Nanotechnology, Narosa Publishing House Pvt Ltd, 2010.

   UNIT I: Chapter 1: 1.1 -1.12

   UNIT II: Chapter 6: 6.1 - 6.8

   UNIT IV: Chapter 4: 4.1 - 4.7

   UNIT V: Chapter 7:7.1-7.13

2. K.K. Chattopadhyay and A.N. Banerjee, Introduction to Nanoscience and Nanotechnology, PHI Learning Pvt. Ltd, 2012.

   UNIT III: Chapter 6: 6.1 - 6.4.9

   UNIT IV: Chapter 7: 7.1 -7.4

BOOKS FOR REFERENCE:

1. Richard Booker and Earl Boysen, Nanotechnology, Wiley Publishing Inc. USA, 2005.
2. J.H. Fendler, Nano particles and nano structured films; Preparation, Characterization and Applications, John Wiley & Sons, 2007.
3. B.S. Murty, P. Shankar, Baldev Raj, B.B. Rath, James Murday, Textbook of Nanoscience and Nanotechnology, Universities Press, 2012.

INTERNSHIP

Semester: V

Code : 23PH5IN01 **Credits: 2**

COURSE OUTCOMES:

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

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

Semester: V				**# INTERNSHIP**							**Credit: 2**
Code : 23PH5IN01											
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**				**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	2	3	2	3	5	3	3	2	2	2.90
CO - 2	4	2	2	5	2	5	4	5	5	2	2	3.45
CO - 3	4	2	2	5	2	4	4	4	5	2	2	3.27
CO - 4	3	2	5	5	2	4	3	4	5	5	2	3.63
CO - 5	3	5	4	4	5	3	3	3	4	4	5	3.90
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

JACEP - EXTENSION

U.G. PROGRAMME OUTCOMES (2023 - 2026)

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Acquire comprehensive knowledge and evaluate analytically in their specific disciplines.
2.	Apply the acquired knowledge in professional and social life.
3.	Evolve new methodologies in the specific disciplines leading to innovation and employability.
4.	Develop critical thinking required to pursue research.
5.	Apply the computational and life skills to the challenging problems in life.
6.	Design and develop independent projects.

U.G. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO. NO.	UPON COMPLETION OF THIS PROGRAM THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO - 1	Understand and identify the needs of the community and articulate viewpoints both practically and theoretically.	PO-1, PO-3
PSO - 2	Develop among themselves a sense of social and civic responsibility to be more culturally equipped.	PO-2, PO-3, PO- 4, PO- 6
PSO - 3	Apply their education in finding practical solutions to individual, community problems to exercise their rights properly.	PO - 1, PO- 3, PO- 4, PO- 6
PSO - 4	Acquire leadership qualities and a democratic attitude by carrying out their duties as effective citizens of the country.	PO- 2, PO- 3, PO- 5
PSO - 5	Develop the capacity to think clearly and cogently to meet emergencies and national disasters and practise national integration and social harmony.	PO- 3, PO- 4, PO- 5

JACEP - EXTENSION

Semester: V-VI **Hours: 60**

Code : 23SLPEX01 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Impart knowledge on education.	PSO-2, PSO-3	K1
CO - 2	Get awareness of environmental issues and solve the issues.	PSO-1, PSO-5	K2
CO - 3	Develop a concern for the voiceless and faceless and rectify it.	PSO- 1, PSO-2, PSO-5	K3
CO - 4	Analyse the reasons for health problems and impart knowledge on a balanced diet.	PSO-1, PSO- 3	K4
CO - 5	Apply different fields of knowledge to the society.	PSO-3, PSO- 4, PSO-5	K5

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

Semester: V -VI				JACEP - EXTENSION								Hours: 60
Code : 23SLPEX01												Credit: 1
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	3	3	4	4	3	3	3	5	3	3	5	3.54
CO - 2	3	4	3	2	4	3	4	5	4	5	2	3.55
CO - 3	3	4	5	3	3	4	3	3	5	3	5	3.72
CO - 4	2	2	3	3	2	3	3	5	5	5	3	3.27
CO - 5	3	3	3	3	3	3	4	4	4	3	3	3.27
Overall Mean Score												3.47

Result: The Score for this Course is **3.47** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: LITERACY GROUP:

Giving orientation for the students about JACEP - importance of education awareness of dropouts and counselling the parents to re-admit the school dropouts- organizing activities based on the disciplines - arranging competitions for school children - educating the school children about the positives and negatives of social media- Higher studies after +2.

UNIT II: HEALTH AND HYGIENE GROUP:

Doing a survey on health problems - organizing medical camps and talks - organizing basic medical check-ups, conducting health and hygiene talk by B. Voc students of JAC to the adopted villages- Balance diet, orientation about home nurse- rapport with Government and NGO's

UNIT III: LIAISON GROUP & PEOPLE ORGANIZATION GROUP:

Motivating workers to access government savings schemes with unorganised sectors- celebrating important days - Services offered in E- Sevai centres- organizing income generation skill training for self-help groups. organizing population education programmes - conducting awareness programmes on emerging social issues - rapport with non-governmental organizations and local bodies to ensure the development of the villages - organizing youth, farmers and self-help group to function democratically-

UNIT IV: ENVIRONMENTAL GROUP:

Tree and sapling plantation - promotion of Herbal Gardens - observing environmental-related days -awareness campaign to educate the villagers to protect the environment.

UNIT V: APPLICATION OF KNOWLEDGE:

Conducting Special Skill Training for self-employment based on discipline to the target group with the help of NGO's and government organizations - awareness on social media.

BOOKS FOR REFERENCE:

1. Higher studies after +2
2. Services offered in E- Sevai services
3. பிறப்பு முதல் இறப்பு வரை அரசு ஆவணங்கள்/ சேவைகள் வழிகாட்டு கையேடு
4. அரசு நலத்திட்ட உதவிகள் தகவல் கையேடு
5. வருவாய் மற்றும் பேரிடர் மேலாண்மை துறை மூலம் பொது மக்களுக்கு இ சேவை வழியாக இணையதள மின் சேவை

SCHEME OF EVALUATION

	Continuous Internal Assessment	
1.	Attendance (60 hours)	10 Marks
2.	Field Visit & Report	50 marks
3.	Assignment	40 Marks
	Total	**100 marks**

NUCLEAR AND PARTICLE PHYSICS

Semester: VI **Hours: 5**

Code : 23PH6MC09 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	List the properties of nucleus, radioactive rays and cosmic rays	PSO -1, PSO - 2	K1
CO - 2	Describe the nuclear composition, nuclear reactions and cosmic ray effects	PSO - 2	K2
CO - 3	Demonstrate the experiments on radioactivity, working of particle detectors, accelerators and nuclear reactors	PSO - 3	K3
CO - 4	Distinguish various nuclear models, decay theories of radioactivity and elementary particles	PSO - 3, PSO - 4	K4
CO - 5	Evaluate various parameters of nucleus, natural and artificial radioactivity and nuclear reactions	PSO - 5	K5

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

Semester: VI							**NUCLEAR AND PARTICLE PHYSICS**					**Hours: 5**
Code : 23PH6MC09												**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	2	3	2	5	5	5	3	2	2	3.27
CO - 2	4	2	3	3	2	5	4	5	3	3	2	3.27
CO - 3	4	2	2	5	2	4	4	4	5	2	2	3.27
CO - 4	4	2	5	5	2	3	4	3	5	5	2	3.63
CO - 5	4	5	2	2	5	3	4	3	2	2	5	3.36
Overall Mean Score												**3.36**

Result: The score for this course is **3.36** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: PROPERTIES OF NUCLEUS

Classification of nuclei - General properties of nucleus - Binding energy - Nuclear stability - Theories of nuclear composition: Proton-electron hypothesis - Proton-neutron hypothesis - Nuclear forces - Meson theory - nuclear models: Liquid drop model - Semi-empirical mass formula - Shell model - Collective model. **(12 Hours)**

UNIT II: PARTICLE ACCELERATORS AND DETECTORS

Particle detectors: Ionization chamber - Solid state detectors - Proportional counter - Geiger-Muller counter - Wilson Cloud Chamber - Scintillation counter - Particle accelerators: Van de Graff generator - Linear accelerator - Cyclotron - Synchrocyclotron - Betatron - Synchrotron - Proton Synchrotron. **(12 Hours)**

UNIT III: RADIOACTIVITY

Natural radioactivity - Properties of alpha, beta and gamma rays - Alpha rays: Determination of e/m - Determination of charge - Range - Geiger-Nuttal experiment - Geiger-Nuttal law - Theory of alpha decay - Gamow's theory - Beta rays: Determination of e/m - Beta ray spectrum - Neutrino theory of Beta decay - Detection of Neutrino - Gamma rays: Determination of wavelength - Origin - Nuclear isomerism - Internal conversion. **(12 Hours)**

UNIT IV: NUCLEAR REACTIONS

Artificial transmutation - Q-value equation - Threshold energy - Energy balance - Types of Nuclear reactions - Conservation laws - Nuclear transmutations - Nuclear fission - Energy released - Chain reaction - Atom bomb - Nuclear reactors - Nuclear fusion - Sources of Stellar energy - Thermonuclear reactions - Fusion reactors.

(12 Hours)

UNIT V: COSMIC RAYS AND ELEMENTARY PARTICLES

Cosmic rays: Latitude effect - Azimuth effect - Altitude effect - Secondary cosmic rays - Cosmic ray showers - Discovery of positron - Mesons - Van Allen belts - Origin of cosmic rays - Elementary particles: Particles and Anti-particles - Antimatter - Fundamental interactions - Quantum numbers - Conservation laws and symmetry - Quark model. **(12 Hours)**

COURSE BOOK:

- R. Murugeshan and Kiruthiga Sivaprasath, Modern Physics, 18th edition, S. Chand and Company Limited, New Delhi, Reprint 2022.

  UNIT I : Chapter 17: 17.1 to 17.7.1

  UNIT II : Chapter 18: 18.3 to 18.7, 18.10, Chapter 19: 19.1 to 19.7

  UNIT III : Chapter 20: 20.1 to 20.4.1(ii), 20.7 to 20.10, 20.10.2, 20.10.3, 20.12-20.15

  UNIT IV : Chapter 21: 21.1 to 21.3, Chapter 22: 22.1 to 22.3, 22.6, 22.7

  UNIT V : Chapter 23: 23.1 to 23.10, Chapter 24: 24.1 to 24.7

BOOKS FOR REFERENCE:

1. N. Subrahmanyam, Brijlal and Jivan Seshan, Atomic and Nuclear Physics, S. Chand & Company Limited, New Delhi, 2008.
2. J. B. Rajam, Modern Physics, S. Chand & Company Limited, New Delhi, 1957.
3. N. K. Sehgal, K. L. Chopra and D. L. Sehgal, Modern Physics, Sultan Chand & Sons, New Delhi, 2004.
4. M. N. Avadhanulu, An Introduction to Lasers-Theory and Applications, Second Revised Edition, S. Chand & Company Limited, New Delhi, 2012.
5. Arthur Beiser, Perspective of Modern Physics, McGraw Hill Book Company, 1969.
6. S. Ramamoorthy, A Textbook of Modern Physics, National Publishing House, Delhi, 1965.

DIGITAL ELECTRONICS AND MICROPROCESSOR 8085

Semester: VI **Hours: 5**

Code : 23PH6MC10 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Define logic circuits with basic gates and structure of a microprocessor	PSO - 1	K1
CO-2	Associate gates with flip flops, registers and explain the internal architecture of a microprocessor	PSO - 1, PSO - 2	K2
CO-3	Identify the operations of flip-flops, registers and various memory-initiated operations.	PSO - 3	K3
CO-4	Examine the truth tables of digital circuits and illustrate the organization of microprocessor architecture.	PSO - 4	K4
CO-5	Assess the various digital circuits and the microcomputer system	PSO - 5	K5

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

Semester: VI				DIGITAL ELECTRONICS AND MICROPROCESSOR 8085								Hours: 5
Code : 23PH6MC10												Credit: 4
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO-1	5	2	3	3	2	4	5	4	3	3	2	3.27
CO-2	5	2	4	3	2	5	5	5	3	4	2	3.64
CO-3	3	2	3	5	2	4	3	4	5	3	2	3.27
CO-4	4	2	5	3	2	3	4	3	3	5	2	3.27
CO-5	4	5	4	3	5	3	4	3	3	4	5	4.00
Overall Mean Score												3.49

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

Note:

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

Values Scaling:

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

UNIT I: DIGITAL LOGIC

Binary Number Systems- Binary-to-decimal conversion - Decimal-to-Binary Conversion - Octal Numbers - Hexadecimal Numbers - 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

RS Flip flop - Edge triggered RS Flip flops - Edge triggered D Flip flops - Edge triggered JK Flip flops - JK Master Slave Flip flops- 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: 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 V: 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. **(15 Hours)**

COURSE BOOKS:

1. 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, Chapter 5: 5.1-5.5

   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

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

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

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

BOOKS FOR REFERENCE:

1. Herbert Taub and Donald Schilling, Digital Integrated Electronics, McGraw Hill, 1985.
2. S.K. Bose. Digital Systems, New Age International,1992.
3. D.K. Anvekar and B.S. Sonade, Electronic Data Converters: Fundamentals & Application, TMH, 1994.
4. Malvino and Leach, Digital Principles and Applications, TMG Hill Edition, 2014.

MAJOR PRACTICAL - VI

Semester: VI **Hours: 5**

Code : 23PH6CP06 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Define analog and digital circuits.	PSO -1	K1
CO-2	Classify the circuits as oscillators, rectifiers, and logical circuits.	PSO - 2	K2
CO-3	Examine the outputs from the circuits and compare their truth tables	PSO - 3	K3, K4
CO-4	Correlate the observed results to the theoretical values.	PSO - 4	K4
CO-5	Design oscillators, rectifiers, and flip-flops with desired parameters	PSO - 5	K5

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

Semester: VI				**MAJOR PRACTICAL - VI**							**Hours: 5**
Code : 23PH6CP06											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	2	3	3	2	4	5	4	3	3	2	3.27
CO-2	3	2	3	4	2	5	3	5	4	3	2	3.27
CO-3	3	2	4	5	2	3	3	3	5	4	2	3.27
CO-4	4	2	5	4	2	3	4	3	4	5	2	3.45
CO-5	3	5	2	3	5	4	3	4	3	2	5	3.55
Overall Mean Score												**3.36**

Result: The score for this course is **3.36** (High Relationship)

Note:

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

Values Scaling:

Mean Score of COs = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / 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 and measure its frequency.
3. Verification of De-Morgan's theorem using Integrated circuits.
4. Construction and verification of truth tables for X-OR and X-NOR gates.
5. Study the characteristics of FET.
6. Construction of UJT relaxation oscillator and measure its frequency.
7. Construction of Phase shift oscillator using a transistor and measure its frequency.
8. Construction and verification of truth tables for - RS, JK and D 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 PRACTICAL - VII

Semester: VI **Hours: 5**

Code : 23PH6CP07 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain the working of the Logic gates, Op Amp and Micro Processor (μP)	PSO - 1	K1
CO-2	Demonstrate the performance of the logic and electronic circuits	PSO - 2	K2
CO-3	Build Logic gates, Op Amp circuits and perform μP programs	PSO - 3	K3
CO-4	Deduce the results from circuits and verify the truth tables	PSO - 3, PSO - 4	K4
CO-5	Assess the results with the standard values	PSO - 5	K5

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

Semester: VI				**MAJOR PRACTICAL - VII**					**Hours: 5**		
Code : 23PH6CP07									**Credit: 3**		
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	2	3	3	2	4	5	4	3	3	2	3.27
CO-2	4	2	3	3	2	5	4	5	3	3	2	3.27
CO-3	4	2	3	5	2	4	4	4	5	3	2	3.45
CO-4	4	2	5	5	2	3	4	3	5	5	2	3.64
CO-5	4	5	2	3	5	3	4	3	3	2	5	3.55
Overall Mean Score												**3.44**

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

Note:

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

Values Scaling:

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

LIST OF PRACTICALS (Any eight)

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 Serial-IN and SERIAL-OUT Shift registers.
4. Construction and verification 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. Addition & Multiplication operations using Intel 8085 μP.
9. Subtraction & Division operations using Intel 8085 μP.
10. Ascending and Descending order for the given set of binary numbers using Intel 8085 μP.

#SOLID STATE PHYSICS

Semester: VI **Hours: 3**

Code : 23PH6DE3A **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain the internal structure of solids and how the large-scale properties of solid materials result from their atomic scale properties	PSO - 1, PSO - 4	K1
CO-2	Classify the structural and physical properties of materials	PSO - 4	K2
CO-3	Articulate crystal structure emphasis on electrical, thermal, dielectric and superconducting behavior of solids	PSO - 3	K3
CO-4	Apply their knowledge to solve problems in solid state physics.	PSO - 2	K4
CO-5	Compare electrical, thermal, dielectric and superconducting factors of various crystal structures	PSO - 5	K5

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

Semester: VI				**#SOLID STATE PHYSICS**							**Hours: 3**
Code : 23PH6DE3A											**Credit:2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	5	2	5	4	2	2	5	2	4	5	2	3.45
CO-2	4	2	5	2	2	3	4	3	2	5	2	3.09
CO-3	4	5	3	3	5	2	4	3	5	3	2	3.55
CO-4	3	2	3	4	2	5	3	5	4	3	2	3.27
CO-5	4	5	4	2	5	3	4	3	2	4	5	3.73
Overall Mean Score												**3.42**

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

Note:

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

Values Scaling:

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

UNIT I: BONDING IN SOLIDS

Forces between atoms - Cohesion of atoms and Cohesive energy - Calculation of cohesive energy - Bonding in solids - Bonding in solids- Ionic Bonding - Bond Energy of NaCl Molecule- Properties of Ionic Solids Examples of ionic solids- Covalent bond - Properties of covalent compounds-Metallic Bond - properties of metallic crystals - Intermolecular Bond - Dispersion bond - Dipole Bonds - Hydrogen Bond **(9 Hours)**

UNIT II: CRYSTALLINE SOLIDS

Lattice points and Space Lattice- The basis of Crystal Structure- Unit Cells and Lattice parameters- Unit cell versus Primitive Cell- Crystal Systems- Space Groups- The Bravais space Lattices- Metallic Crystal Structure-Relation between the density of crystal and lattice constant in a cubic lattice - X-Ray Diffraction- Bragg's law - Bragg's X-ray Spectrometer - Powder Crystal Method- Rotating Crystal Method **(9 Hours)**

UNIT III: ELECTRIC AND THERMAL PROPERTIES OF SOLIDS

Thermal conductivity in metals - Thermal expansion - conductivity at high frequencies - Joules law- Thermionic Emission - Schottky Effect - Specific Heat- Classical Theory (Dulong and Petit Law)- Einstein's Theory of specific heat- Debye's Theory **(9 Hours)**

UNIT IV: DIELECTRIC PROPERTIES OF MATERIALS

Microscopic Concept of Polarization- Langevin's Theory of Polarization and polar dielectrics- Internal field in solids and liquids- Clausius- Mosotti Relation- The static dielectric constant of solids and liquids - Piezoelectricity- The complex dielectric constant and dielectric loss **(9 Hours)**

UNIT V: SUPERCONDUCTIVITY OF MATERIALS

Mechanism of Superconductors- effects of magnetic field- Flux Exclusion (The Meissner Effect)- Thermal Properties- Energy Gap- Isotope Effect- Mechanical Effects- The Penetration Depth - Type I and Type II Semiconductor- London Equations: Electrodynamics- Thermodynamics of superconductors- BCS Theory - Quantum Tunnelling **(9 Hours)**

COURSE BOOK:

- S.O. Pillai, Solid State Physics, New Age International Publishers, Eighth Multicolor Edition, 2018

  UNIT I: Chapter 3: I-VII, XII, XIV, XVIII, XIX, XXI- XXIV

  UNIT II: Chapter 4: II-VI, XIII- XIV, Chapter 5: VII-XI

  UNIT III: Chapter 6: XXV, XXVI, XXVIII, XXIX, XXXI, Chapter 7: I-V

  UNIT IV: Chapter 11: II- VI, VIII, X

  UNIT V: Chapter 8: III, IV, VII-XIV, XVIII- XIX

BOOKS FOR REFERENCE:

1. C. Kittel, Introduction to Solid State Physics, Willey Eastern Ltd, 2003.
2. Rita John, Solid State Physics, 1st edition, Tata McGraw Hill publishers, 2014.
3. R. L. Singhal, Solid State Physics, Kedarnath Ram Nath & Co, Meerut, 2003.
4. J.P. Srivastava, Elements of Solid-State Physics, 2nd Edition, Prentice-Hall of India, 2006.

#COMMUNICATION PHYSICS

Semester: VI **Hours: 3**

Code : 23PH6DE3B **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Recognize the use of various communication systems in everyday life	PSO - 1	K1
CO-2	Understand the important techniques used in communication	PSO - 2	K2
CO-3	Implement the understanding of communication networks in professional and personal life	PSO - 5	K3
CO-4	Analyze the role of physics in the field of communication	PSO - 3	K4
CO-5	Categorize various types of communication systems	PSO - 4	K5

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

Semester: VI				#COMMUNICATION PHYSICS							Hours: 3
Code :23PH6DE3B											Credit: 2
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO-1	5	2	3	3	2	4	5	4	3	3	2	3.27
CO-2	4	2	4	3	2	5	4	5	3	4	2	3.45
CO-3	4	5	2	3	5	3	4	3	3	2	5	3.55
CO-4	4	2	3	5	2	3	4	3	5	3	2	3.27
CO-5	4	2	3	3	2	3	4	3	3	5	2	3.09
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: RADIO TRANSMISSION AND RECEPTION

Transmitter - Modulation - Types of modulation - Amplitude modulation - Limitations of amplitude modulation - Frequency modulation - Comparison of FM and AM - Demodulation- Essentials in demodulation - Receivers: AM radio receivers - Types of AM radio receivers - Stages of super heterodyne radio receiver, advantages - FM receiver - Difference between FM and AM receivers. **(9 Hours)**

UNIT II: FIBER OPTIC COMMUNICATION

Basic principle of fiber optics - Advantages - Construction of optical fiber - Classification based on the refractive index profile - Classification based on the number of modes of propagation - Losses in optical fibers - Attenuation - Advantages of fiber optic communication. **(9 Hours)**

UNIT III: RADAR COMMUNICATION

Basic radar system -Radar range - Antenna scanning -Pulsed radar system - Search radar -Tracking radar - Moving target indicator Doppler effect - MTI principle - CW Doppler radar. **(9 Hours)**

UNIT IV: SATELLITE COMMUNICATION

History of satellites - Satellite communication system - Satellite orbits - Basic components of Satellite communication system - Commonly used frequency in Satellite - communication -Multiple access communication - Satellite communication in India. **(9 Hours)**

UNIT V: MOBILE COMMUNICATION

Concept of cell -Basic cellular mobile radio system - Cell phone - Facsimile - Important features of FAX machine - Application of Facsimile - VSAT (very small aperture terminals) - Modem - IPTV (internet protocol television) - Wi-Fi-4G (basic ideas) (**9 Hours)**

COURSE BOOKS:

1. V.K. Metha, Principles of Electronics, S. Chand & Co Ltd, 2013

   UNIT I: Chapter 16: All Sections

2. A.K. Anokh Singh and Chopra, Principles of Communication Engineering, S. Chand & Co, 2013

   UNIT II: Chapter 14: All Sections

   UNIT III: Chapter 16: All Sections

   UNIT IV: Chapter 13: All Sections

   UNIT V: Chapter 20: All Sections

BOOKS FOR REFERENCE:

1. J.S. Chitode, Digital Communications, Unicorn publications, 2020.
2. M. Senior John, Optical Fiber Communications: Principles and Practice, Pearson Education, 2009.

#ENERGY PHYSICS

Semester: VI **Hours: 3**

Code : 23PH6DE3C **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Describe various energy sources and allied technology required for energy conversion	PSO - 1	K1
CO-2	Understand basic characteristics of energy sources and technology for their utilization	PSO - 1, PSO - 2	K2
CO-3	Identify applications of different energy sources to real world energy problems	PSO - 4	K3
CO-4	Analyze harnessing of various sources of energy	PSO - 5	K4
CO-5	Develop self-learning capability to design & establish renewable energy systems	PSO - 3	K5

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

Semester: VI				**#ENERGY PHYSICS**							**Hours: 3**
Code :23PH6DE3C											**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	2	3	3	2	4	5	4	3	3	2	3.27
CO-2	5	2	3	4	2	5	5	5	4	3	2	3.64
CO-3	4	2	5	3	2	3	4	3	3	5	2	3.27
CO-4	4	5	2	2	5	3	4	3	2	2	5	3.36
CO-5	4	3	3	5	3	2	4	2	5	3	3	3.36
Overall Mean Score												**3.38**

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

Note:

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

Values Scaling:

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

UNIT I: INTRODUCTION TO ENERGY SOURCES

Energy consumption as a measure of prosperity - World energy future - Energy sources and their availability - Conventional energy sources - Non-conventional and Renewable energy sources - Comparison - Merits and demerits. **(9 Hours)**

UNIT II: SOLAR ENERGY

Solar constant - Solar radiation at the Earth's surface - Solar radiation geometry - Solar radiation measurements - Solar radiation data -Solar energy storage and storage systems - Solar Pond - Solar cooker - Solar water heater - Solar greenhouse - Types of greenhouses - Solar cells. **(9 Hours)**

UNIT III: WIND ENERGY

Nature of the wind - Basic principle of wind energy conversion - Wind energy data and energy estimation - Basic components of Wind Energy Conversion Systems (WECS) - Advantages and disadvantages of WECS - Applications **(9 Hours)**

UNIT IV: BIOMASS ENERGY

Classification - Biomass conversion technologies - Fermentation -Photosynthesis - Biogas generation -Classification of biogas plants - Anaerobic digestion for biogas - Wood gasification - Advantages & Disadvantages. **(9 Hours)**

UNIT V: ENERGY STORAGE

Importance of energy storage - Fuel cells - Types of fuel cells - Advantages and Disadvantages of fuel cells - Applications of fuel cells - Batteries - Lead acid battery -Nickel-Cadmium battery - Hydrogen storage. **(9 Hours)**

COURSE BOOK:

- G.D. Rai, Non-Conventional Sources of Energy, 5th Edition, Khanna Publishers, 2009.

  UNIT I: Chapter 1: 1.1-1.4, 1.6, 1.14-1.15

  UNIT II: Chapter 2: 2.1-2.4, 2.6, 2.8

  Chapter 4: All sections

  Chapter 5: 5.1-5.2, 5.6, 5.11-5.12

  UNIT III: Chapter 6: 6.1-6.3, 6.5, 6.7, 6.13

  UNIT IV: Chapter 7: 7.1-7.4, 7.6,7.11, 7.24, 7.25

  UNIT V: Chapter 16: 16.1-16.2

  Chapter 10: 10.1, 10.2 (10.2.1, 10.2.3-10.2.5, 10.2.9), 10.3 (10.3.1, 10.3.2, 10.3.5)

  Chapter 11: 11.3

BOOKS FOR REFERENCE:

1. John Twidell & Tony Weir, Renewable Energy Resources, 2nd Edition, Taylor & Francis, 2005,
2. S.A. Abbasi and Nasema Abbasi, Renewable Energy sources and their environmental impact, PHI Learning Pvt. Ltd, 2008.
3. M. P. Agarwal, Solar Energy, S. Chand & Co. Ltd., New Delhi, 1982.
4. H. C. Jain, Non-Conventional Sources of Energy, Sterling Publishers, 1986.

PROJECT

Semester: VI **Hours: 4**

Code : 23PH6PR01 **Credit: 3**

COURSE OUTCOMES:

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

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

Semester: VI							**PROJECT**					**Hours: 4**
Code : 23PH6PR01												**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	2	3	2	4	5	4	3	2	2	3.09
CO - 2	5	2	3	4	2	5	5	5	4	3	2	3.64
CO - 3	4	2	3	5	2	4	4	4	5	3	2	3.45
CO - 4	3	2	5	3	2	4	3	4	3	5	3	3.27
CO - 5	3	5	4	3	5	3	3	3	3	4	5	3.73
Overall Mean Score												**3.44**

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

Note:

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

Values Scaling:

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

#WORKSHOP PRACTICE

Semester: VI **Hours: 3**

Code : 23SE6PH04 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Identify electrical tools and electrician side kick.	PSO - 1	K1
CO-2	Explain the outputs of inductive, capacitive and reactance calculator. Identify electrical tools and electrician side kick.	PSO - 2	K2
CO-3	Handle the equipments in workshop practice.	PSO - 3	K3
CO-4	Analyze the hole size, components, soldering methods needed for layout.	PSO - 4	K4
CO-5	Design different layouts on PCB and verify the outputs.	PSO - 5	K5

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

Semester: VI				#WORKSHOP PRACTICE							Hours: 3
Code : 23SE6PH04											Credit: 2
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO-1	4	4	3	3	4	5	5	3	3	3	3	3.63
CO-2	4	4	4	3	4	3	3	5	4	3	3	3.63
CO-3	3	2	5	3	4	4	2	5	5	3	4	3.63
CO-4	4	4	4	4	4	4	3	2	4	5	2	3.63
CO-5	4	2	4	4	4	3	2	3	5	2	5	3.45
Overall Mean Score												3.36

Result: The score for this course is **3.36** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF PRACTICALS:

1. Introduction to Hand tools and measuring instruments.
2. Make L Joint from the given mild steel plate.
3. Drill a hole of required size (m8) and to tap the inner thread on the hole.
4. 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 : 23PH6SS01 **Credits: 2***

UNIT I: BIOPOTENTIAL ELECTRODES AND TRANSDUCERS

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

COURSE BOOKS:

- 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

BOOKS FOR REFERENCE:

1. Leslie Cromwell, Fred Weibell, Erich Pfieffer, Biomedical Instrumentation & Measurements, Prentice Hall of India, New Delhi, 2002.
2. R. S. Khandpur, Handbook of Biomedical Instrumentation, 2nd Edn, Tata McGraw Hill, New Delhi, 2003.
3. Kuppusamy Thayalan, Basic Radiological Physics 2nd Edn, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, 2017.

ATMOSPHERE, WEATHER AND CLIMATIC CHANGES

Semester: VI

Code : 23PH6SS02 **Credits: 2***

UNIT I: INTRODUCTION

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

UNIT II: ATMOSPHERE

Composition of Atmosphere: Primary Gases - Greenhouse 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

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.

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.

UNIT V: CLIMATE CHANGE

Climate forcing - Climate feedback- 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.

COURSE BOOKS

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

  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.

APPLICATIONS OF SOLAR ENERGY

Semester: VI

Code : 23PH6SS03 **Credits: 2***

UNIT I: SOLAR ENERGY AND HEAT TRANSFER

Solar spectrum - Solar radiation - Terrestrial and extraterrestrial regions - Solar time - Instruments - Pyrheliometer - Pyranometer - Sunshine recorders- Sun - Earth Angles. 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- Radiation- Radiation involving real surface.

UNIT II: SOLAR COLLECTORS

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 - Evacuated tube Cover Collector - Solaron Collector - Phillips (Germany) Collector - Thermal efficiency - Evacuated-tubular Collector

UNIT III: SOLAR WATER AND AIR HEATING SYSTEM

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

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

UNIT V: ENERGY STORAGE AND SOLAR CELLS

Sensible heat storage - Liquid media storage - Well mixed liquid storage - Space heat and hot water - Solid media storage - Packed-bed storage. Doping - Fermi level - p-n Junction - Characteristics p-n Junction - Photovoltaic Effect - Photovoltaic Material - Single crystal solar cell - Thin film solar cell - Amorphous Si solar cell - Tandem solar cell - Concentrating solar cell.

COURSE BOOK:

- 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

UNIT II: Chapter 3: 3.1 to 3.3, 3.5,3.5.1 to 3.5.3

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 6.3

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 13.5

BOOKS FOR REFERENCE:

1. G.D. Rai, Non-Conventional Sources of Energy, 4th Edn, Khanna Publishers, 2009.
2. S. P. Sukhatme, J. K. Nayak, Solar Energy, Principles of Thermal Collection and Storage, 3rd Edn, McGraw Hill, 2008.
3. M. P. Agarwal, Solar Energy, S. Chand & Co. Ltd., New Delhi,1982.

HOW THINGS WORK

Semester: VI

Code : 23PH6SS04 **Credits: 2***

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: VEHICLE

Bicycle: Back-Pedaling brake and Freewheel - Variable Gear Hub - Motor cycle - Diesel engine - Brakes- Steering - Headlights - Electronic horn - Flashing Direction Indicator - Speedometer

UNIT IV: CAMERA

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

UNIT V: TELECOMMUNICATION DEVICES

Telephony and telephone exchange techniques - Switching Operation - Circuit of Push Button Selector - Rapid contact relay - Telephone cables - Cable Duct - Jointing champers - Branching of cable - Long distance frequency cable

COURSE BOOKS

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

BOOKS FOR REFERENCE:

1. Umme Ammara, The Physics in our Daily Lives, Gugucool Publishing, Hyderabad, 2019.
2. Walter Lawin, For the love of physics, Free Press, New York, 2011.

SKILL DEVELOPMENT PROGRAMME (SDP) (CERTIFICATE COURSE)

MOBILE TECHNOLOGY

Code: 23PH1SD01 **Hours: 60**

Credits: 2

COURSE OUTCOMES:

- Explain the concepts of electronic components.
- Describe cellular communication systems.
- Perform IC Installation, removal and analyze the jumper system.
- Recite types of displays and their replacement methods.
- Explain Flashing techniques of mobile phones.

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-Career Plus 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

PAPER I: LIFE OF MAHATMA GANDHI

Code: CCHYGT01 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

- Gain Knowledge on the Early Life of Mahatma Gandhi.
- Analyse the racial equality and Mahatma Gandhi's Experience in South Africa.
- Explain the role of Mahatma Gandhi in Indian Freedom Struggle.
- Assess the constructive works of Mahatma Gandhi in Indian Nationalism.
- Discuss the major Incidents from the Life of Mahatma Gandhi.

UNIT I

Family background and beginnings of the Mahatma - Birth and childhood - Education and family life - lessons learned - The London Experience.

UNIT II

Making of the Mahatma: Gandhi in South Africa - From a barrister to a people's leader - Towards racial equality - From family life to ashram life - Birth of Satyagraha and constructive work - experiments with truth.

UNIT III

Beginnings of Indian Freedom Struggle: Early resistances and 1857 Revolt - Birth of Indian National Congress: Moderates, Extremists and Terrorists - Gandhi leads the nation in a new direction - Early micro satyagrahas.

UNIT IV

Mahatma Gandhi leads the Freedom struggle to victory: Major satyagrahas - Constructive Work - Sabarmathi and Sevagram - Various currents of Indian Nationalism - Towards partition and freedom - The final martyrdom.

UNIT V

Video shows on Gandhi - Field and life experiences - Incidents from the life of Gandhi that inspired and shaped your life.

தாள் I - மகாத்மா காந்தியின் வாழ்வு - CCHYGT01

Code: CCHYGT01 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

- Gain Knowledge on the Early Life of Mahatma Gandhi.
- Analyse the racial equality and Mahatma Gandhi's Experience in South Africa.
- Explain the role of Mahatma Gandhi in Indian Freedom Struggle.
- Assess the constructive works of Mahatma Gandhi in Indian Nationalism.
- Discuss the major Incidents from the Life of Mahatma Gandhi.

அலகு 1

குடும்ப பின்னணியும் மகாத்மாவின் தொடக்கமும் - பிறப்பும் குழந்தைப் பருவமும் - கல்வியும் குடும்ப வாழ்வும் - கற்ற பாடங்கள் - இலண்டன் அனுபவங்கள்.

அலகு 2

மகாத்மா உருவாகிறார் - தென்னாப்பிரிக்காவில் காந்தி - பாரிஸ்டரிலிருந்து மக்கள் தலைவராக - இன சமத்துவத்தை நோக்கி - குடும்ப வாழ்விலிருந்து ஆசிரம வாழ்வுக்கு - சத்தியாகிரகம் மற்றும் தீர்மானப்பணியின் தொடக்கம் - சத்திய பரிசோதனைகள்.

அலகு 3

இந்திய விடுதலைப் போராட்டத்தின் தொடக்கம் - ஆரம்ப கால எதிர்ப்புகளும் 1857 எழுச்சியும் - இந்திய தேசிய காங்கிரசின் தொடக்கம் - மிதவாதிகள், தீவிரவாதிகள் மற்றும் பயங்கரவாதிகள் - காந்தி நாட்டை புதிய திசையில் நடத்துகிறார் - ஆரம்ப வட்டார சத்தியாகிரங்கள்.

அலகு 4

மகாத்மா காந்தி இந்திய விடுதலைப் போராட்டத்தை தலைமையேற்று நடத்துகிறார் - தேசிய சத்தியாகிரங்கள் - நிர்மாணப் பணிகள் - சபர்மதியும் சேவாகிராமும் - இந்திய தேசியத்தின் பல்வேறு போக்குகள் - பிரிவினையும் விடுதலையும் - மகத்தான உயிர் தியாகம்.

அலகு 5

காந்தியைப் பற்றிய படங்கள் - கள மற்றும் வாழ்க்கை அனுபவங்கள் - உங்களது வாழ்வை பரவசப்படுத்திய, உருக்கிய மகாத்மா காந்தியின் வாழ்க்கை நிகழ்ச்சிகள்.

RECOMMENDED BOOKS

PAPER I

Mahatma Gandhi : An Autobiography சத்திய சோதனை

R. Nanda : Mahatma Gandhi - A Biography

Ravindra varma : Gandhi in Anecdotes, Navajivan Publishers, Ahmedabad, 2001

டி.டி. திருமலை : காந்தி

கல்கி : மாந்தருள் ஒரு தெய்வம் இவானதி பதிப்பகம் சென்னை 1991

திரு.வி.க. : காந்தியடிகளும் மனித வாழ்க்கையும்

ஜெயகாந்தன் : வாழ்விக்க வந்த காந்தி

J.B. Kriplani : Gandhi His Life and Thought

லூயி பிஷர் : மகாத்மா காந்தி

Louis Fischer : The Life of Mahatma Gandhi, Harper Collins Publishers, Uttarpradesh, 2017

பா. ஆனந்தி, மங்களவதி கேப்ரியல் ரூ : காந்திய சிந்தனை வினா-விடை

வி.ஏ. வித்யா : (Gandhian Thought Quiz)

சி. பெரிதாய் ரூ பா. ஆனந்தி : மகாத்மா காந்தியடிகளின் காலம்

COURSE BOOK:

- மகாத்மா காந்தியின் வாழ்வும் அறவியலும் - டாக்டர் பா. ஆனந்தி ரூ டாக்டர் ச. செயப்பிரகாசம்
- Life and Values of Mahatma Gandhi - Dr. B. Ananthi & Dr. S. Jeyapragasam

PAPER II: NON VIOLENCE AND SARVODAYA

Code: CCHYGT02 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

- Gain Knowledge on Mahatma Gandhi's Non - violence
- Discuss the Policies of Mahatma Gandhi on Truth and Action
- Analyse Sarvodaya and Antyodaya
- Assess the values introduced through Brahmacharya and Aparigraha
- Relate violence and Truth in our day today life with the teachings of Gandhiji

UNIT I

Meaning of Nonviolence (*ahimsa*): Nonkilling and noninjuring - Love, service and forgiving - Nonviolent Action: Peaceful resolution of conflict, nonviolent life style & constructive work and Satyagraha - Nonviolent values and ethics

UNIT II

Truth: Absolute and Relative - Moving beyond falsehood, errors and mistakes - Truth and pluralism - Truth and action - Truth and Nonviolence

UNIT III

Sarvodaya (welfare of all at all levels) and Antyodaya (welfare of the last first) - Means and Ends - Removal of untouchability - Communal Harmony - Uplift of Women

UNIT IV

Removal of poverty: Full & total appropriate employment - Self-dependence, Self - reliance, Swaraj and Swadeshi (love thy neighbour) - Self-control and Sublimation (*brahmacharya*) - Simple and Ethical living - *Aparigraha* (nonpossession) and Trusteeship (stewardship) - Appropriate and Holistic Science and Technology.

UNIT V

Place of Nonviolence and truth in our day to-day life and ways to enhance them - learn and practice three skills which would enhance your self-reliance and ability to help (serve) others in need - Resolve conflicts peacefully - Experience inter-religious relationships, dialogue and prayers.

தாள் II - அகிம்சையும் சர்வோதயமும்

Code: CCHYGT02 **Hour: 1**

Credit: 1

COURSE OUTCOMES:

- Gain Knowledge on Mahatma Gandhi's Non - violence
- Discuss the Policies of Mahatma Gandhi on Truth and Action
- Analyse Sarvodaya and Antyodaya
- Assess the values introduced through Brahmacharya and Aparigraha
- Relate violence and Truth in our day today life with the teachings of Gandhiji

அலகு 1

அகிம்சையின் பொருள் - கொல்லாமையும் துன்பம் செய்யாமையும் - அன்பு, தொண்டு மற்றும் மன்னித்தல் - அகிம்சைச் செயல்- அமைதி வழியில் சிக்கல் தீர்வு, அகிம்சை வாழ்வியலும் நிர்மாணப்பணியும், சத்தியாகிரகம் - அகிம்சை அறவியலும் விழுமியங்களும்.

அலகு 2

உண்மை : பேருண்மையும் (முழுமை உண்மையும்) சார்பு உண்மையும்- பொய்மைகள், தவறுகள் மற்றும் குற்றங்களுக்கு அப்பால் செல்லுதல் - உண்மையும் பன்மியமம் - உண்மையும் செயலும் - உண்மையும் அகிம்சையும்.

அலகு 3

சர்வோதயமும் (அனைவரின் நலம் அனைத்து நிலைகளிலும்) அந்தியோதயமும் (கடையவர் நலன் முதலில்) - குறிக்கோளும் வழிமுறையும் - தீண்டாமை நீக்கம் - சமூக ஒற்றுமை - மகளிர் முன்னேற்றம்.

அலகு 4

வறுமை நீக்கம் : முழுமையான ஏற்புடைய வேலை வாய்ப்பு - தற்சார்பும் தன்னிறைவும், சுயராஜ்ஜியம் மற்றும் சுதேசி (அயலவரை நேசி) - புலனடக்கமும் மேன்மையாக்கமும் (பிரம்மச்சரியம்) - எளிய மற்றும் அறவியல் வாழ்வு உடைமையின்மையும், அறங்காவலர் நெறியும் - ஏற்புடைய மற்றும் முழுமை அறிவியலும் தொழில் நுட்பமும்.

அலகு 5

நமது அன்றாட வாழ்வில் அகிம்சையும் உண்மையும் பெறுமிடமும் அதனை மேம்படுத்தும் வழிகளும் - உங்களது தற்சார்பையும் தேவையில் பிறருக்கு உதவும் ஆற்றலையும் வளர்க்கும் ஏதாவது மூன்று திறன்களைக் (ளுமடைடள) கற்றல் - அமைதி வழியில் சிக்கல் தீர்வு அனுபவங்கள் - சர்வசமய நட்புறவு, உரையாடல் மற்றும் வழிபாட்டு அனுபவம் பெறல்.

RECOMMENDED BOOKS

PAPER II

M.K. Gandhi	: Sarvodaya
	: Nonviolence in Peace and War (2 Vols)
Richard B. Gregg	: Power of Nonviolence
மு. வசந்தா (பதி.)	: சர்வோதயம்
R.R. Diwakar	: The Saga of Satyagraha
ச. செயப்பிரகாசம்	: அகிம்சை, மதுரை, 2008

COURSE BOOK:

- மகாத்மா காந்தியின் வாழ்வும் அறவியலும் - டாக்டர் பா. ஆனந்தி ரூ டாக்டர் ச. செயப்பிரகாசம்
- Life and Values of Mahatma Gandhi - Dr. B. Ananthi & Dr. S. Jeyapragasam

SKILL DEVELOPMENT PROGRAMME (SDP)

LIBRARY AND INFORMATION SCIENCE

THEORY PAPER & PRACTICAL

PROGRAMME OUTCOMES (PO)

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

THEORY PAPER & PRACTICAL

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Have knowledge about the Library Resources and Services.	PO-2, PO-5
2.	To get Equipped with capabilities required for placement in Libraries	PO-2, PO-5
3.	To Use maximum of resources available in the Library.	PO-1
4.	Get the basic practical approaches to use online resources.	PO-5, PO-6
5.	Familiarize with the Principles of Management in Library Services.	PO-4

OBJECTIVES:

- To familiarize the students with the methods of maintaining Library Resources and Services.
- To equip them with capabilities required for placement in Libraries.

TEACHING HOURS

The Certificate course will be conducted in 60 contact hours per year as follows

Theory = 30 Hours
Practical = 30 Hours

ELIGIBILITY

Any III U.G. and any P.G. Student

SYLLABUS
THEORY PAPER

Code: 23GL1SD01 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Have knowledge about the various types of Libraries.	PSO - 1	K1
CO - 2	Understand the various kinds of Reference sources available in the Library	PSO - 1	K2
CO - 3	Get the analytical approaches to classify and Arrange the reading materials in Library	PSO - 2	K4
CO - 4	Apply various methods to search the reading material and thereby get it at the earliest	PSO - 3	K3
CO - 5	To Acquire knowledge about the managerial principles and techniques in Libraries.	PSO - 5	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

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

Code: 23GL1SD01				THEORY PAPER						Hours: 2		
											Credit: 1	
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	3	4	4	4	4	4	3	4	4	4	4	3.82
CO - 2	4	4	4	4	4	4	4	4	4	4	4	4
CO - 3	3	3	4	4	4	3	3	4	4	3	3	3.45
CO - 4	4	4	4	4	4	4	4	4	4	4	4	4
CO - 5	4	4	4	3	3	3	3	3	4	4	4	3.55
Overall Mean Score												**3.76**

Result: The score for this course is **3.76** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: LIBRARY AND SOCIETY

Five Laws of Library Science - Extension services - Types of Library - Orientation to Library Staff and Students

UNIT II: INFORMATION SOURCES & SERVICES

Information - Reference Service, Definition, Kinds - Kinds of Sources of Information - Standard Ready Reference Sources - Bibliography - Definition, Types - Abstract: APA style.

UNIT III: CLASSIFICATION THEORY

Library classification - Definition, need and purposes - Colon Classification 6th Edition and Dewey Decimal Classification 20th Edition: General features.

UNIT IV: CATALOGUING THEORY

Definition, objectives and functions of catalogue - Physical and inner forms of catalogue - OPAC

UNIT V: LIBRARY MANAGEMENT

Principles of Management - Library Rules - Library routines (Selection, Acquisition, Technical processing) - Circulation Systems(Charging & Discharging), Automated charging system - Preservation of reading materials

UNIT VI: INFORMATION TECHNOLOGY

Computer application to Library work - Internet: General features, Search engines -e-resources - E-Library / Digital Library - INFLIBNET N-List, SHODHSINDH

PRACTICAL PAPER

Code: 23GL1SDP1 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Apply colon classification scheme in classifying the reading materials.	PSO - 2	K3
CO - 2	Analyse the title according to Dewey Decimal Classification Scheme.	PSO - 2	K4
CO - 3	Synthesis code for the book title according to colon Classification.	PSO - 5	K6
CO - 4	Apply code for the book title according to Dewey Decimal Classification.	PSO - 2	K3
CO - 5	Get practical approaches to search and download online resources.	PSO- 2	K3

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

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

Code: 23GL1SDP1				PRACTICAL PAPER							Hours: 2 / Credit: 1
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	3	3	4	4	4	4	3	4	4	4	3	3.64
CO - 2	4	3	4	4	4	4	4	4	3	4	4	3.82
CO - 3	4	4	4	4	4	3	3	4	4	3	3	3.64
CO - 4	3	4	4	4	4	4	4	4	4	4	4	3.91
CO - 5	3	4	4	3	3	3	3	3	4	4	4	3.45
Overall Mean Score												**3.69**

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

Note:

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

Values Scaling:

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

Colon Classification -6th edition, Main Classes

1. Dewey Decimal Classification 20th edition - I, II & III Summary

2. Computer - Internet searching and to download information

3. INFLIBNET N-List - Searching process

BOOKS FOR REFERENCE:

1. Library Organisation and Decision Making - J. B.Sharma - Pointer Publishers, Jaipur - 2008

2. Library and Information Science - C.K. Sharma, Akhil Kumar Singh and Rakesh Kumar- Atlantic publishers & distributors (P) Ltd. - 2008

3. Reference Service - Mr. Krishan Kumar

4. Basics of Library and Information Science - K.T.Dilli, Vikas Publishing.

5. Preservation of Library, Archival and Digital Documents - L.S.Ramaiah & G. Sujatha - ESS ESS Publications, New Delhi - 2008

6. E-Libraries in Computer age - C.Praveen S ingh - Alfa publications, New Delhi - 2008

7. Colon Classification - S.R.Ranganathan - 6th Edition - Asia publishing house, New Delhi - 1960

8. Dewey Decimal Classification - Edited by John P Comaromi etc. - 20th Edition - Forest press, New York - 1989

EVALUATION METHOD

Theory Paper Code : 23GL1SD01		Practical Paper Code : 23GL1SDP1	
Internal	25 Marks	Internal	40 Marks
External	75 Marks	External	60 Marks
Total	**100 Marks**	**Total**	**100 Marks**

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - 2023-2026 -UG

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

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

Theory:

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

PRACTICAL:

Continuous Internal Assessment (CIA) - 40 Marks

External Practical Exam - 60 Marks

PASSING MINIMUM FOR EXTERNAL SEMESTER EXAMINATION -UG

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

INTERNAL QUESTION PATTEREN (UG)

Class: **Time: 2 Hours**

Date: **Max.: 40 Marks**

Title of the Paper

Course Outcome	Bloom's K-level	Q. No	SECTION
			SECTION – A (10 x 1 = 10 marks) MCQs
			SECTION – B (2 × 5= 10 Marks) Answer ALL Questions. (Internal Choice)
			SECTION – C (2x 10 =20 Marks) Answer All Question. (Internal Choice)

EXTERNAL QUESTION PATTEREN

UG External Question Pattern for the courses carrying credits 5 and above

Class: **Time: 3 Hours**

Date: **Max.: 100 Marks**

Title of the Paper

Course Outcome	Bloom's K-level	Q. No	SECTION
			SECTION – A (15 x 1 = 15 marks) MCQs
			SECTION – B (5× 2= 10 Marks) Answer any FIVE Questions out of SEVEN
			SECTION – C (5x 5 =25 Marks) Answer All Question. (Internal Choice, one question from each Unit)
			SECTION – D (5x 10 =50 Marks) Answer All Question. (Internal Choice, one question from each Unit)

EXTERNAL QUESTION PATTEREN

UG External Question Pattern for the courses carrying credits below 5

Class: **Time: 2 ½ Hours**

Date: **Max.: 75 Marks**

Title of the Paper

Course Outcome	Bloom's K-level	Q. No	SECTION
			SECTION – A (15 x 1 = 15 marks) MCQs
			SECTION – B (5x 6 = 30 Marks) Answer All Question. (Internal Choice, one question from each Unit)
			SECTION – C (3x 10 =30 Marks) Answer All Question. (Internal Choice)

SKILL DEVELOPMENT PROGRAMME (SDP)

LIBRARY AND INFORMATION SCIENCE

PROGRAMME OUTCOMES (PO)

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

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Have knowledge about the Library Resources and Services.	PO-2, PO-5
2.	To get Equipped with capabilities required for placement in Libraries	PO-2, PO-3
3.	To Use maximum of resources available in the Library.	PO-1
4.	Get the basic practical approaches to use online resources.	PO-5, PO-6
5.	Familiarize with the Principles of Management in Library Services.	PO-4

OBJECTIVES:

- To familiarize the students with the methods of maintaining Library Resources and Services.
- To equip them with capabilities required for placement in Libraries.

TEACHING HOURS

The Certificate course will be conducted in 180 contact hours per year as follows

Theory - Paper I = 60 Hours

Theory - Paper II = 60 Hours

Practical Paper = 60 Hours

ELIGIBILITY

Plus Two passed / Any U.G. and P.G. Student

SYLLABUS

THEORY PAPER - 1: FUNDAMENTALS OF LIBRARY AND INFORMATION SCIENCE

Code: 24GL1SD01 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

- Have knowledge about the types, principles, classification, cataloguing and routine work of the Library
- Understand the types, principles, classification, cataloguing and routine work of the Library
- Apply the principles, classification, cataloguing and routine work of the Library
- Get the analytical approaches in the types, principles, classification, cataloguing and routine work of the Library
- Evaluate the types, principles, classification, cataloguing and routine work of the Library

UNIT I

Library concept and definitions; Types of libraries - Public, Academic and Special Libraries - Role of libraries in modern society.

UNIT II

Five Laws of Library Science and their implications. Principles of Management - Library Budget, Types

UNIT III

Library classification - Definition, need and purposes - Colon Classification 6th Edition and Dewey Decimal Classification: Main Classes

UNIT IV

Library Cataloguing - Definition, objectives and functions of catalogue - Physical and inner forms of catalogue - OPAC

UNIT V

Various sections in a Library- Routine work in Acquisition, Technical, Circulation, Maintenance, Reference, and Binding Sections

BOOKS FOR REFERENCE:

1. Library Organisation and Decision Making - J. B.Sharma - Pointer Publishers, Jaipur - 2008

2. Library and Information Science - C.K. Sharma, Akhil Kumar Singh and Rakesh Kumar- Atlantic publishers & distributors (P) Ltd. - 2008

3. Basics of Library and Information Science - K.T.Dilli, Vikas Publishing.

4. Colon Classification - S.R.Ranganathan - 6th Edition - Asia publishing house, New Delhi - 1960

5. Dewey Decimal Classification - Edited by John P Comaromi etc. - 20th Edition - Forest press, New York - 1989

6. Current Trends and Fundamentals in Library and Information Science - Sr. R. Fatima Mary **Sylvia**,Pavai Publications, Chennai - 2012

THEORY PAPER -2: INFORMATION SOURCES & SERVICES

Code: 24GL1SD02 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

- Have knowledge about the types and kinds of Information Sources and Services.
- Understand the types and kinds of Information Sources and Services.
- Apply the types and kinds of Information Sources and Services.
- Get the analytical approaches of the types and kinds of Information Sources and Services in the practical life situation.
- Evaluate the types and kinds of Information Sources and Services.

UNIT I

Sources of Information - Documentary - Non- Documentary - Types of Information Sources - Primary, Secondary, Tertiary Sources

UNIT II

Kinds of Sources of Information - Standard Ready Reference Sources and Long-Range Reference Sources

UNIT III

Information Services - Reference Service - Definition, Need and Types - Ready Reference Service - Long Range Reference Service - User Needs - User Education, Extension services.

UNIT IV

E-resources - Concept and evolution; Merits and demerits of e-resources

UNIT V

Library Automation and Digitization- Digital Library- Artificial Intelligence applications in Libraries

BOOKS FOR REFERENCE:

1. Reference Service - Mr. Krishan Kumar
2. Digital Libraries Tools & Techniques - C. Praveen Singh - Alfa Publications, New Delhi - 2008
3. Library and Information Science - C.K.Sharma, Akhil Kumar Singh and Rakesh Kumar - Vol.III - Atlantic Publishers & Distributors (P) Ltd. - 2008
4. Current Trends and Fundamentals in Library and Information Science - Sr. R. Fatima Mary **Sylvia**, Pavai Publications, Chennai - 2012

PRACTICAL PAPER

Code: 24GL1SDP1 **Hours: 2**

Credit: 1

COURSE OUTCOMES:

- Acquire the knowledge of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET
- Understand the concept of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET
- Apply the knowledge of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET
- Analyse the practical knowledge of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET
- Synthesis the practical approaches of Colon Classification, Dewey Decimal Classification, ICT and INFLIBNET

Paper 3 - INFORMATION PROCESSING PRACTICE

Code: 24GL1SDP1 **Hours: 2**

Credit: 1

4. Classification: Colon Classification 6th edition, Main Classes
5. Classification: Dewey Decimal Classification 20th edition - I, II & III Summary
6. ICT - Internet Browsing; Downloading
7. E-Resources in INFLIBNET N-List - Browsing; Downloading

BOOKS FOR REFERENCE:

1. Digital Libraries Tools & Techniques - C. Praveen Singh - Alfa Publications, New Delhi - 2008
2. Colon Classification - S.R.Ranganathan - 6th Edition - Asia publishing house, New Delhi - 1960
3. Dewey Decimal Classification - Edited by John P Comaromi etc. - 20th Edition - Forest press, New York - 1989

EVALUATION METHOD

Theory Paper – 1 Fundamentals of Library and Information Science Code : 24GL1SD01		**Theory Paper - 1 Information Sources & Services Code : 24GL1SD02**		**Practical Paper Code : 24GL1SDP1**	
Internal	25 Marks	Internal	25 Marks	Internal I	50 Marks
External	75 Marks	External	75 Marks	Internal II	50 Marks
Total	**100 Marks**	**Total**	**100 Marks**	**Purely Internal, Total**	**100 Marks**

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - 2023-2026 -UG
CIA components for Practical can be decided by the respective Departments.

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

Theory: Internal Component

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

Question Patern					
SECTION	**Types of Question**	**Number of Qns.**	**Number of Qns. to be answered**	**Marks for each Qn.**	**Total**
A Q. No (1-15)	Multiple Choice	15	15	1	15
B Q. No (16-21)	either or type.	6	5	5	30
C Q. No (22-24)	either or type	3	3	10	30

YOGA FOR YOUTH EMPOWERMENT

Semester: Non semester **Hours: 2**

Code : 23YYSD01 **Credit: 2**

OBJECTIVES:

- Providing value education to improve the students' character.
- Understanding yogic life and physical health.
- Maintaining youthfulness.
- Measure and method in five aspects of life.

UNIT: 1

Physical Health: Manavalakalai (SKY) Yoga - Introduction - Education as a means for youth empowerment - Greatness of Education - Yoga for youth Empowerment.

Simplified Physical Exercises - Hand, Leg, Breathing. Eye exercises - Kapalabathi, Makarasana Part I, Makarasana Part II, Body Massage, Acu pressure, Relaxation exercises – Benefits. **Yogasanas I** - Pranamasana - Hastha Uttanasana - Pada asthasana – Aswa Sanjalana Asana - Thuvipatha asva Sanjalana asana - Astanga Namaskara –Bhujangasana. Altha Muktha Savasana, Aswa Sanjalana Asana – Pada Hasthasana - Hastha Uttanasana - Pranamasana. **Pranayama** - Naddi suddi - Clearance Practice- Benefts. Simplified Physical Exercise - Kayakalpa Pracices - Meditation Practices. **(6 Hours)**

UNIT II

Life force: Reasons or Diseases - Natural reasons (Genetic / imprints, Planetary Position, Natural calamities and climatic changes) - Unnatural reasons (Food habits, Thoughts, Deeds). **Philosophy of Kaya kalpa** - Physical body - Sexual vital fluid - Life force - Bio-Magnetism-Mind. **Maintaining youthfulness** - Postponing old age - Transformation of food into seven components - Importance of sexual vital fluid - Measure and method in five aspects of life - Controlling undue Passion. **Kayakalpa practice** - Aswini Mudra - Ojas breath - Benefts of Kaya Kalpa. **(6 Hours)**

UNIT III

Mental Health: Mental Frequencies - Beta, Apha, Theta and Delta wave - Agna Meditation explanation-benefits. **Shanti meditation** - Shanthi Meditation explanation – benefits. **Thuriya Meditation** - Thuriya Meditation explanation – benefits. **Benefits of Blessing** - Self blessing (Auto suggestion) - Family blessing - Blessing the others -World blessing - Divine protection. **(6 Hours)**

UNIT IV

Values: Human Values - Self-control - Self-confidence - Honesty Contentment- Humility Modesty Tolerance- Adjustment- Sacrifice- Forgiveness. Purity (Body, Dress, Environment) - Physical purity - Mental purity - Spiritual purity. **Social Values -** Nonviolence - Service Patriotism Equality. Respect for parents and elders - care and protection - Respect for teacher. Punctuality - Time Management.

(6 Hours)

UNIT V

Morality (virtues): Importance of introspection - I - Mine (Ego, Possessiveness) Six Evil Temperaments - Greed - Anger- Miserliness - Immoral sexual passion Inferiority and superiority Complex - Vengeance. Maneuvering of Six Temperaments - Contentment Tolerance - Charity Chastity - Equality – Pardon (Forgiveness). Five essential Qualities acquired through Meditation - Perspicacity- Magnanimity - Receptivity - Adaptability -Creativity (Improved Memory Power).

(6 Hours)

BOOKS FOR REFERENCE:

- Yoga for modern age - Thathuvagnani Vethathiri Maharishi.
- Simplified Physical Exercises- Thathuvagnani Vethathiri Maharishi.
- Kayakalpam - Thathuvagnani Vethathiri Maharishi.
- Thirukkural - Rev.Dr.G.U.Pope.
- Mind- Thathuvagnani Vethathiri Mahaishi.
- Sound Health through yoga- Dr.Chandrasekaran.
- Light on yoga –BKS Jyenger.
- Unavu murai - Thathuvagnani Vethathiri Maharishi.

EVALUATION

YOGA FOR YOUTH EMPOWERMENT

Internal	External	Total
25	75	**100**

CIA Components

Component		Marks
Test-I	:	40
Test - II	:	40
Assignment	:	05
Quiz/Seminar	:	10
Attendance	:	05
Total	**:**	**100**

The total internal marks obtained for 100 will be Converted into marks obtained for 25

YOGA FOR YOUTH EMPOWERMENT

(EXTERNAL – EVALUATION)

Time: 3 Hours **Max. Marks: 75**

Part	Types of questions	Number of Qns.	Number of Qns. to be answered	Marks for each qn.	Total
A Q. NO (1-20)	MCQ(Four questions from each Unit)	20	20	1	20
B Q. NO (21-25)	Either (or) type. (Two questions from each unit)	10	5	5	25
C Q. NO (25-30)	Open choice (One question from each unit)	5	3	10	30

PRACTICAL - YOGA FOR YOUTH EMPOWERMENT -23YYSD02

Semester: Non- Semester **Hours: 2**

Code : 23YYSD02 **Credit: 1**

1. **Simplified Physical Exercises** - Hand, Leg, Breathing. Eye exercises - Kapalabathi, Makarasana Part I, Makarasana Part II, Body Massage, Acu pressure, Relaxation exercises – Benefits.
2. **Yogasanas I** - Pranamasana - Hastha Uttanasana - Pada asthasana – Aswa Sanjalana Asana - Thuvipatha asva Sanjalana asana - Astanga Namaskara – Bhujangasana. Altha Muktha Savasana, Aswa Sanjalana Asana – Pada Hasthasana - Hastha Uttanasana - Pranamasana.
3. **Pranayama** - Naddi suddi - Clearance Practice- Benefts. Simplified Physical Exercise - Kayakalpa Pracices - Meditation Practices.

YOGA FOR YOUTH EMPOWERMENT – PRACTICAL -I (Internal Only)

CIA Components for Internal Assessment

Components		**Marks**
Component- I (**Physical Exercises)**	:	50
Component- II (**Yogasanas I)**	:	25
Component –III (**Pranayama)**	:	25
Total	**:**	**100**