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. MATHEMATICS

(2023-2026)

DEPARTMENT OF MATHEMATICS

PROGRAMME OUTCOMES - U.G.

PO. NO.	UPON COMPLETION OF THIS COURSE 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.

PROGRAMMESPECIFIC OUTCOMES - U.G.

PSO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO-1	Perceive the relevance of the subject in various fields such as science, technology, business and industries.	PO-1
PSO-2	Interpret the graphical and numerical data and apply the analytical, theoretical and computational skills to solve problems.	PO-4
PSO-3	Acquaint with the knowledge on the effects of changing conditions in real life systems to construct mathematical models and excel in various decision making tasks	PO-3
PSO-4	Understand mathematical ideas and foundations of mathematics to develop proficiency in Mathematics	PO-5 PO-6
PSO-5	Engage in activities directly benefiting the broader community and acquire job oriented knowledge	PO-2

B.Sc. Mathematics Course Pattern (2023 - 2026)

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	23MA1MC01	Theory of Equations and Summation of Series	6	5
		23MA1MC02	Differential Calculus and Trigonometry	5	4
		23PH1AC1A/ 23PH1AC1B	Mechanics, Properties of Matter and Thermal Physics/Gravitation, Heat and Sound	3	3
		23PH1AP1A/ 23PH1AP1B	Allied Physics Practical -I/ Allied Physics Practical - II	2	1
	IV	23AE1PE01	**# Ability Enhancement Course - 1 (AEC-1):** Professional English	2	2
	IV	23MA1FC01	**# Foundation Course:** Mathematical Foundations	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**	**23**
II	I	23GT2GS02/ 23GH2GS02	Tamil - II/ Hindi – II	6	3
	II	23GE2GS02	English – II	4	3
	III	23MA2MC03	Analytical Geometry of 3-Dimensions and Theory of Numbers	6	5
		23MA2MC04	Integral Calculus and Vector Calculus	5	4
		23PH2AC2A/ 23PH2AC2B	Electricity, Electronics & Atomic Physics/ Optics, Spectroscopy & Modern Physics	3	3
		23PH2AP2A/ 23PH2AP2B	Allied Physics Practical -III/ Allied Physics Practical - IV	2	1
	IV	23AE2VE02	**# Ability Enhancement Course - 2 (AEC-2):** Sustainability Life Skills	2	2
		23SE2CE02	**# Skill Enhancement Course - 1 (SEC-1):** Effective English	2	2
II	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**	**23**

Sem.	Part	Code	Title of the Course	Hours	Credit
III	I	23GT3GS03/ 23GH3GS03	Tamil - III/ Hindi – III	6	3
	II	23GE3GS03	English – III	4	3
	III	23MA3MC05	Elements of Mathematical Analysis	5	5
		23MA3MC06	Differential Equations and its Applications	5	4
		23MA3AC3A/ 23MA3AC3B	Mathematical Statistics / Combinatorial Mathematics	5	4
	IV	23SE3MA03	**# Skill Enhancement Course-2 (SEC-2):** LaTeX– Lab	1	1
		23MA3GE01/ 23GE3NC01	**# Generic Elective-1:** Techniques in Project Scheduling / 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	23MA4MC07	Mechanics	5	4
		23MA4MC08	Transform Techniques	4	4
		23MA4AC4A/ 23MA4AC4B	Statistics with R / Integral Transforms and Z - Transforms	5	4
	IV	23SE4OA4B	**# Skill Enhancement Course-3 (SEC-3):** Office Fundamentals	3	2
		23MA4GE02/ 23GE4NC02	**# Generic Elective-2:** Mathematics for Life / 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	Credit
V	III	23MA5MC09	Abstract Algebra	5	4
		23MA5MC10	Real Analysis	6	5
		23MA5MC11	Programming in C++ - Theory	4	4
		23MA5CP01	Programming in C++ - Lab	2	1
		23MA5MC12	Graph Theory and Applications	5	4
		23MA5DE1A/ 23MA5DE1B/ 23MA5DE1C	**Discipline Specific Elective-1** Fluid Dynamics/ Linear Programming/ Astronomy	4	3
		23MA5DE2A/ 23MA5DE2B/ 23MA5DE2C	**Discipline Specific Elective-2** Fuzzy sets/ Numerical Methods with Applications/ Cryptography	4	3
	IV	23MA5IN01/ 23MA5IT01	# Internship / Industrial Training (Carried out in II year Summer vacation) (30 hours)	-	2
	V	23SLPEX01	**Service Learning Programme:** Extension (JACEP)	-	-
			Total	**30**	**26**
VI	III	23MA6MC13	Linear Algebra	5	4
		23MA6MC14	Complex Analysis	5	3
		23MA6MC15	Mathematical Modelling	5	3
		23MA6MC16	Operations Research	5	3
		23MA6PR01	Project*	4	3
		23MA6DE3A/ 23MA6DE3B/ 23MA6DE3C	**# Discipline Specific Elective-3** Boolean Algebra / Industrial Mathematics / Automata Theory and Formal Languages	3	2
	IV	23SE6MA04	**# Skill Enhancement Course-4 (SEC - 4): (Domain Specific Skill Courses)** Mathematical Tools	3	2
	V	23MA6SS01/ 23MA6SS02/ 23MA6SS03/ 23MA6SS04/ 23MA6SM01	**Self Study Course:** Financial Mathematics/ Applicable Mathematics/ Applied Mathematics/ Fuzzy Graphs/ MOOCs	-	2*
		23SLPEX01	**Service Learning Programme:** Extension(JACEP)	-	1
			Total	**30**	**21+2***
			Total	**180**	**140+3***

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

*** Group Project**

 # Purely Internal Paper

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

ALLIED COURSES OFFERED BY THE DEPARTMENT

CODE	TITLE OF THE COURSE
23MA1AC1A	Essential Mathematics -I
23MA1AC1B	Calculus of Finite Differences
23MA2AC2A	Essential Mathematics-II
23MA2AC2B	Classical Algebra

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
23MA1SD01	**Skill Development Programme (SDP)** Problem Solving Skills

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**

Internal Components for the Skill Enhancement Course

SEC -2 - LaTeX-Lab - 23SE3MA03
SEC -3 - Office Fundamentals – 23SE4OA4B
SEC -4 - Mathematical Tools – 23SE6MA04

INTERNAL COMPONENTS	BLOOM'S LEVEL	MARKS DISTRIBUTION (INTERNAL) 100 MARKS
Class Activities	K1	5
Record	K2	15
Lab Assessment	K3	20
Practical Test I	K4	30
Practical Test II	K5	30

PRACTICAL

Continuous Internal Assessment (CIA) - 40 Marks
External Practical Exam - 60 Marks

INTERNAL COMPONENTS	BLOOM'S LEVEL	MARKS DISTRIBUTION (INTERNAL) 40 MARKS	EXTERNAL COMPONENTS	MARKS DISTRIBUTION (EXTERNAL) 60 MARKS
Class Activities	K1	5	Understanding the problem	5
Record	K2	5	Developing the program	5
Lab Assessment	K3	10	Program Execution	20
Practical Test I	K4	10	Output	20
Practical Test II	K5	10	Viva	10

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**

INTERNSHIP

COMPONENTS		MARKS
Internal	:	50 Marks
External	:	50 Marks
Total	:	**100 Marks**

INTERNAL COMPONENTS

COMPONENTS		MARKS
Report Submission	:	25 Marks
Presentation and Viva (internal)	:	25 Marks
External (Awarded by the Respective Guide / Intern site)	:	50 Marks

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) FOR THE PRACTICALS CAN BE DECIDED BY THE RESPECTIVE DEPARTMENT

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)	

INTERNAL QUESTION PATTERN

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)

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)

SKILL DEVELOPMENT PROGRAMME (CERTIFICATE COURSE)

INTERNAL QUESTION PATTERN

Class : **Time : 2 Hours**

Date : **Max. : 40 Marks**

CODE AND TITLE OF THE COURSE:

Q. No	SECTION
1 -15	SECTION - A (10 × 2 = 20 marks) Answer any TEN Questions out of fifteen
16 -23	SECTION - B (5 × 4 = 20 Marks) Answer any FIVE Questions out of eight

EXTERNAL QUESTION PATTERN

Class : **Time : 2 $\frac{1}{2}$ Hours**

Date : **Max. : 75 Marks**

CODE AND TITLE OF THE COURSE:

Q. No.	SECTION
1 - 15	SECTION - A (10× 3 = 30 marks) Answer any TEN Questions out of fifteen
16 - 23	SECTION - B (5 × 9 = 45 Marks) Answer any FIVE Questions out of eight

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

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=

THEORY OF EQUATIONS AND SUMMATION OF SERIES

Semester: I **Hours: 6**

Code : 23MA1MC01 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify suitable methods to solve algebraic equations and the series	PSO - 1	K1
CO - 2	Infer the algebraic equations and series sum	PSO - 2	K2
CO - 3	Apply the known results in solving problems	PSO - 3	K3
CO - 4	Analyze the given equation to find the solution and the series to find the sum	PSO - 4	K4
CO - 5	Assess the given equation and the series	PSO - 5	K5

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

Semester: I				THEORY OF EQUATIONS AND SUMMATION OF SERIES							Hours: 6
Code : 23MA1MC01											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	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	4	3	3	3	3	5	3	3	3.45
CO - 4	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 5	3	5	3	3	3	3	3	3	3	3	5	3.36
Overall Mean Score												3.42

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

Note:

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

Values Scaling:

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

UNIT I

Theory of Equations: Reminder theorem - Relations between the roots and coefficients of equations - Symmetric function of the roots - Sum of the powers of the roots of an equation - Newton's theorem on the sum of the powers of roots.

(18 Hours)

UNIT II

Transformations of equations - Reciprocal equation - To increase or decrease the roots of a given equation by a given quantity - Form of the quotient and remainder when a polynomial is divided by a Binomial - Removal of terms - Numerical solution by Horner's method and Newton's method. **(18 Hours)**

UNIT III

Binominal theorem for a rational index - Some important particular cases of the Binomial expansion - Sign of terms in Binomial expansion - Numerically greatest term - Expansion using partial fractions - Application of the Binomial Theorem to the summation of series - Approximate values. **(18 Hours)**

UNIT IV

Exponential series - Exponential limit - 'e' is an incommensurable number - The Exponential theorem - Summation. **(18 Hours)**

UNIT V

The Logarithmic Series - Modification of the logarithmic Series - Euler's constant - Series which can be summed up by the logarithmic series - Calculation of logarithms by means of the logarithmic series - The application of exponential and logarithmic series to limits and approximations. **(18 Hours)**

COURSE BOOK:

- T. K. Manicavachagom Pillay, T. Natarajan & K. S. Ganapathy, Algebra, Volume - I, S. Ananda Book Depot, 2019.

Unit I	:	Chapter 6: Sections 1 - 14
Unit II	:	Chapter 6: Sections 15 - 19 & 30
Unit III	:	Chapter 3: Sections 5 -10 & 14
Unit IV	:	Chapter 4: Sections 1 - 3
Unit V	:	Chapter 4: Sections 5 - 11

BOOKS FOR REFERENCE:

1. R. M. Khan, Algebra, New Central Book Agency (P) Ltd., 2007.
2. S.B. Malik, Basic Number Theory, 2nd Edition, Vikas Publishing House Pvt. Ltd., New Delhi, 2009

E-RESOURCES:

1. https://youtu.be/4alO02Y0WoU
2. https://unacademy.com/course/complete-course-on-theory-of-equations/U1SLPFZ4

DIFFERENTIAL CALCULUS AND TRIGONOMETRY

Semester: I **Hours: 5**
Code : 23MA1MC02 **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 derivatives and trigonometric functions	PSO - 1	K1
CO - 2	Understand the concept of derivative of a function with respect to another function	PSO - 4	K2
CO - 3	Apply n^{th} derivative of standard functions to solve real life problems	PSO - 2	K3
CO - 4	Analyse the given curves and the relation between circular and hyperbolic functions	PSO -3	K4
CO - 5	Reframe tangent and normal in polar form	PSO - 5	K5

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

Semester: I				**DIFFERENTIAL CALCULUS AND TRIGONOMETRY**							**Hours: 5**
Code : 23MA1MC02											**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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

The Chain rule for differentiation - Differentiation of Inverse functions - Differentiation by transformation - Logarithmic differentiation - Differentiation of functions represented in terms of a parameter. **(15 Hours)**

UNIT II

Differentiation of a function with respect to another function - Differentiation of Implicit functions - Higher derivatives - n^{th} Derivative of some standard functions - Leibnitz's theorem. **(15 Hours)**

UNIT III

Euler's Theorem - Tangent and Normal - Polar Curves - p-r equations. **(15 Hours)**

UNIT IV

Expansions of cos $n\theta$ and sin $n\theta$ - Expansion of tan $n\theta$ in powers of tan θ - Expansions of tan (A+ B+ C+….) - Powers of sines and cosines of θ in terms of functions of multiples of θ - Expansions of sin θ, and cos θ in a series of ascending powers of θ. **(15 Hours)**

UNIT V

Hyperbolic functions - Relation between circular and hyperbolic functions - Inverse hyperbolic functions - Logarithm of complex quantities. **(15 Hours)**

COURSE BOOKS:

1. S. Arumugam and A. Isaac, Calculus (Differential and Integral Calculus) - Part I, New Gamma Publishing House, 2014.
2. S. Narayanan & T. K. Manicavachagom Pillay, Trigonometry, S. Viswanathan (Printers & Publishers) Pvt. Ltd., 2008.

Unit I	:	Chapter 2: Sections 2.4 - 2.8 (Book 1)
Unit II	:	Chapter 2: Sections 2.9 - 2.13 (Book 1)
Unit III	:	Chapter 3: Sections 3.1 - 3.3 (Book 1)
Unit IV	:	Chapter 3 (Book 2)
Unit V	:	Chapter 4
		Chapter 5: Section 5 (Book 2)

BOOKS FOR REFERENCE:

1. James Stewart, Calculus - Early Transcendentals, 7e, Cengage Learning Pvt.Ltd, New Delhi,2012.
2. Thomas & Fenny, Calculus, 9th Ed. Pearson, USA, 2002.

E-RESOURCES:

1. https://www.khanacademy.org/math/differential-calculus.
2. https://www.classcentral.com/course/introduction-to-ordinary-differential-equations-p-92976.
3. https://www.khanacademy.org/math/trigonometry.

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

UNIT I

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

UNIT II

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

UNIT III

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

UNIT I

Algebraic and Transcendental equations - Introduction - Errors in numerical computation -Iteration method - Bisection method (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 FOR 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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	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 -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**

MATHEMATICAL FOUNDATIONS

Semester: I **Hours: 2**

Code : 23MA1FC01 **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 of some basic mathematical concepts	PSO-2	K1
CO - 2	Understand the applications of numbers, angles and calculus	PSO-3	K2
CO - 3	Apply geometrical concepts to real life problems	PSO-1, 2	K3
CO - 4	Illustrate complex concepts through practical examples	PSO-4	K4
CO - 5	Appraise the beauty of Mathematics	PSO-5	K5

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

Semester: I				**MATHEMATICAL FOUNDATIONS**							**Hours: 2**
Code : 23MA1FC01											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 2	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 3	5	3	3	5	3	3	5	5	3	3	3	3.72
CO - 4	2	3	3	3	5	5	2	3	3	5	5	3.36
CO - 5	3	5	3	3	3	3	3	3	3	3	3	3.36
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

Algebra: Binomial theorem, General term, middle term, problems based on these concepts. **(6 Hours)**

UNIT II

Sequences and series (Progressions), Fundamental principle of counting, Factorial n. **(6 Hours)**

UNIT III

Permutations and combinations, Derivation of formulae and their connections, simple applications, combinations with repetitions, arrangements within groups, formation of groups. **(6 Hours)**

UNIT IV

Trigonometry: Introduction to trigonometric ratios, proof of sin(A+B), cos(A+B), tan(A+B) formulae, multiple and sub multiple angles, sin(2A), cos(2A), tan(2A) etc., transformations sum into product and product into sum formulae, inverse trigonometric functions, sine rule and cosine rule. **(6 Hours)**

UNIT V

Calculus: Limits, standard formulae and problems, differentiation, first principle, uv rule, u/v rule, methods of differentiation, application of derivatives, integration - product rule and substitution method. **(6 Hours)**

BOOKS FOR REFERENCE:

1. NCERT class XI and XII text books.
2. State Board Mathematics text books of class XI and XII.

E-RESOURCE:

1. https://nptel.ac.in

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 (பிற துறை மாணவிகளுக்கு மட்டும்)							**Hours: 6**
Code : 23GT2GS02											**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**

அலகு 4

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

அலகு 5: மொழித்திறன் / போட்டித் தேர்வுத் திறன்

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

(குறிப்பு: அலகு4, 5ஆகியனபோட்டித் தேர்வுநோக்கில் நடத்தப்படவேண்டும்)

பாடநூல்கள்

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

பார்வை நூல்கள்

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

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

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

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

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

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

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

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

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

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

NOVEL, ONE ACT PLAY AND GRAMMAR

Semester: II **Hours:5**

Code : 23GH2GS02 **Credit:3**

COURSE OUTCOMES:

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

UNIT I **(15 Hours)**

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

UNIT II **(15 Hours)**

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

UNIT III **(15 Hours)**

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

UNIT IV **(15 Hours)**

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

UNIT V **(15 Hours)**

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

COURSE BOOKS:

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

   The following Ekankies have been prescribed

   a) Rajpoothri Ka badla – Divjendralal Rai

   b) Andher Nagaree - Bharathendu Harichandra

   c) Reed Kee Haddi – Jagadeeshachandra Maathur

   d) Bahu kee Vidha – Shri vinodh Rasthogi

BOOK FOR REFERENCE:

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

   The following topics have been prescribed

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

COMMUNICATIVE ENGLISH – II

Semester: II **Hours: 4**

Code : 23GE2GS02 **Credit: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

ANALYTICAL GEOMETRY OF 3-DIMENSIONS AND THEORY OF NUMBERS

Semester: II **Hours: 6**

Code : 23MA2MC03 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand basic concepts of different coordinate systems	PSO - 4	K1
CO - 2	Infer equations of lines, planes and spheres	PSO - 3	K2
CO - 3	Relate number patterns and explore relationships between numbers	PSO - 2	K3
CO - 4	Evaluate strategies to solve complex problems	PSO - 1	K4
CO - 5	Appraise the arithmetic and three-dimensional geometry	PSO - 5	K5

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

Semester: II				**ANALYTICAL GEOMETRY OF 3-DIMENSIONS AND THEORY OF NUMBERS**							**Hours: 6**
Code : 23MA2MC03											**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 2	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 3	3	3	4	5	3	3	3	5	4	3	3	3.55
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												**3.44**

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

Note:

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

Values Scaling:

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

UNIT I

The Plane: Plane equations in various forms - Angle between two planes - Ratio in which the plane divides the line - Plane through the line - Length of the perpendicular - Bisecting plane - The distance between two parallel planes.

(18 Hours)

UNIT II

The straight line: Symmetrical form - Image of a point - Image of a line in a plane - The plane and the straight line - Angle between a plane and a straight line - Coplanar lines - The shortest distance between two lines. **(18 Hours)**

UNIT III

The sphere: Equation of the sphere - Length of the tangent - Plane section of a sphere - Equation of a circle on a sphere - Intersection of two spheres - The equation of the tangent plane to the sphere. **(18 Hours)**

UNIT IV

Theory of Numbers: Prime and Composite numbers - The sieve of Eratosthenes - Divisors of a given number N - Euler's function $\Phi(N)$ - Integral part of a real number - The highest power of a prime contained in n!. **(18 Hours)**

UNIT V

The product of r consecutive integers is divisible by r! - Congruences - Numbers in arithmetical progression - Fermat's theorem and generalization of Fermat's theorem, Wilson's theorem - theorem - Simple problems. **(18 Hours)**

COURSE BOOKS:

1. T. K. Manicavachagom Pillay and T. Natarajan, A Course Book of Analytical Geometry Part II - Three Dimensions Ananda Book Depot, 2017.
2. T. K. Manicavachagom Pillay, T. Natarajan and K. S. Ganapathy, Algebra Volume - II, S. Viswanathan (Printers & Publishers) Pvt. Ltd., 2008.

Unit I	:	Chapter 2: Sections 1 - 11 (Book 1)
Unit II	:	Chapter 3: Sections 1 - 6 (Book 1)
Unit III	:	Chapter 4: Sections 1 - 8 (Book 1)
Unit IV	:	Chapter 5: Sections 1 - 10 (Book 2)
Unit V	:	Chapter 5: Sections 11 - 18 (Book 2)

BOOK FOR REFERENCE:

1. P R VITTAL, Analytical Geometry 2D and 3D , Pearson India, first Edition, 2013.

E-RESOURCE:

1. https://study.com/academy/topic/analytic-geometry-in-3-dimensions.html

INTEGRAL CALCULUS AND VECTOR CALCULUS

Semester: II **Hours: 5**
Code : 23MA2MC04 **Credit : 4**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire skills in double and triple integrals, differentiation and integration of vector functions	PSO - 1	K1
CO - 2	Predict outcomes using vector algebra and differentiation.	PSO - 5	K2
CO - 3	Articulate change of variables in integrals, and apply beta, and gamma functions	PSO - 4	K3
CO - 4	Connect vector differentiation with the concepts of gradient, divergence, and curl concepts	PSO - 2	K4
CO - 5	Evaluate line and surface integrals with Green, Gauss and Stokes theorems	PSO - 3	K5

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

Semester: II				**INTEGRAL CALCULUS AND VECTOR CALCULUS**							**Hours: 5**
Code : 23MA2MC04											**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	5	3	3	3	3	3	3	3	3	5	3.36
CO - 3	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 4	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 5	3	3	5	3	3	3	3	3	5	3	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

Double integrals : Evaluation of double integrals- Double integrals in polar coordinates. **(15 Hours)**

UNIT II

Triple Integrals: Triple Integrals - Change of variables - Jacobian- Change of variables in the case of two variables - Change of variables in the case of three variables-Transformation from Cartesian to polar coordinates and spherical polar coordinates. **(15 Hours)**

UNIT III

Beta and Gamma Functions: Definition-Convergence of $\Gamma(n)-$ recurrence of Gamma functions- Properties of Beta functions- relation between Beta and Gamma Functions. **(15 Hours)**

UNIT IV

Vector differentiation: Vector algebra - Differentiation of vectors - Gradient - Divergence and curl. **(15 Hours)**

UNIT V

Line and Surface integrals: Line integrals - Surface integrals - Theorems of Green, Gauss and Stokes (Problems only). **(15 Hours)**

COURSE BOOKS:

1. S. Narayanan and T.K.Manicavachagom Pillay, Calculus (Volume-II), Ananda Book Depot, 2018.
2. S. Arumugam and A. Thangapandi Isaac, Vector Calculus, New Gamma Publishing House, November 2017.

Unit I	:	Chapter 5: Sections 2.1,2.2 ,3.1 & 3.2 (Book 1)
Unit II	:	Chapter 5 : Sections 4, Chapter 6 : Sections 1.1,1.2, 2.1, 2.2, 2.3, 2.4 (Book 1).
Unit III	:	Chapter 7: Section 2.1, 2.2, 2.3 , 3, 4, 5 (Book 1)
Unit IV	:	Chapter1: Section 1.1 - 1.4 (Book 2)
Unit V	:	Chapter 3: Sections 3.1 - 3.3 (Book 2)

BOOK FOR REFERENCE:

1. Shanti Narayan and P. K. Mittal, Integral calculus, S. Chand, 2009.

E-RESOURCES:

1. https://youtu.be/ksS_yOK1vtk
2. https://youtu.be/pfCwRLK29h4

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

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

UNIT I

Homogeneous linear equations of 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	COGNITIV E 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-2 (AEC-2)

SUSTAINABILITY LIFE SKILLS

PROGRAMME OUTCOMES

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

PROGRAMME SPECIFIC OUTCOMES

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

SUSTAINABILITY LIFE SKILLS

Semester: II **Hours: 2**

Code : 23AE2VE02 **Credit: 2**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I **6 Hours**

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

UNIT II **6 Hours**

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

UNIT III **6 Hours**

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

UNIT IV **6 Hours**

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

UNIT V **6 Hours**

Sustainable Development Goals.

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

COURSE TEXT:

- Prepared by the members of Foundation Course.

BOOKS FOR REFERENCE:

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

WEB-SOURCES

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

EFFECTIVE ENGLISH

Semester: II **Hours: 2**

Code : 23SE2CE02 **Credit: 2**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I: Easy Enacting **6 Hours**

Orator - Chamber 4 (Paper 1)

Introducing oneself (Unit 4, Lesson 2)

Student and Teacher (Unit 3 Lesson 3)

In a College Campus (Unit 4, Lesson 1)

Orator- Chamber 4 (Paper 2)

Introducing a Person (Unit 1, Lesson 3)

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

Ordering for Food (Unit 1, Lesson 4)

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

Orator- Chamber 3

Phrasal Verbs in Conversation

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

UNIT III: Captivating Collocation **6 Hours**

Orator- Chamber 4

Types of Collocation

Collocation for Situations

UNIT IV: Idiomatic Expression **6 Hours**

Orator- Chamber 5

Idioms for Conversation

Idioms for Situations

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

Orator- Chamber 7

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

INTERNAL COMPONENTS

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

பொதுத்தமிழ் - 3 (பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: மூன்று **நேரம்: 6**

குறியீடு: 23GT3GS03 **புள்ளி: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

அலகு 1: பெருங்காப்பியங்கள்

சிலப்பதிகாரம் - வழக்குரை காதை

மணிமேகலை - ஆதிரை பிச்சையிட்ட காதை

சீவகசிந்தாமணி - பூமகள் இலம்பகம் (பாடல் எண் 2327 - 2336)

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

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

"பள்ள முதுநீர்ப் ....."

"உண்டியுட் காப்புண் ....."

" எத்துணை யாற்று ...."

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

அலகு 2: சமயக் காப்பியங்கள்

பெரியபுராணம் - பூசலார் நாயனார் புராணம்

கம்பராமாயணம் - மந்தரை சூழ்ச்சிப்படலம் (பாடல் எண் 1399 - 1428)

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

வில்லிபாரதம் - மற்போர் சுருக்கம்

சீறாப்புராணம் - புலிவசனித்த படலம் **18 Hours**

அலகு 3: புதினம்

வஞ்சிமாநகரம் (வரலாற்றுப் புதினம்) **18 Hours**

அலகு 4

பாடம் தழுவிய இலக்கிய வரலாறு **18 Hours**

அலகு 5

மொழித்திறன்

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

பாடநூல்கள்

தமிழ்த்துறை வெளியீடு (தொகுப்பு) - பொதுத்தமிழ் - 3

ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி

(தன்னாட்சி), பெரியகுளம்.

முனைவர் சி. பாலசுப்பிரமணியன் - தமிழ் இலக்கிய வரலாறு

பாவை பப்ளிகேஷன்ஸ்,

சென்னை - 60. இரண்டாம் பதிப்பு - 2016.

நா. பார்த்தசாரதி - வஞ்சி மாநகரம் (வரலாற்றுப் புதினம்)

பாவை பப்ளிகேஷன்ஸ், சென்னை - 600 014

முதற்பதிப்பு ஏப்ரல் 2012

பார்வை நூல்கள்

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

Poetry and History of Hindi Literature, Technical Hindi

Semester: III **Hours: 5**

Code : 23GH3GS03 **Credit: 3**

COURSE OUTCOMES:

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

UNIT I **(15 Hours)**

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

UNIT II **(15 Hours)**

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

UNIT III **(15 Hours)**

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

UNIT IV **(15 Hours)**

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

  Banking Terms : 50 only

  Name of the Ministries: 50 only

UNIT V **(15 Hours)**

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

COURSE BOOKS:

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

The following poems have been prescribed

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

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

The following Bakthi kaal have been prescribed

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

BOOKS FOR REFERENCE:

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

The following topics have been prescribed

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

COMMUNICATIVE ENGLISH - III

Semester: III **Hours: 4**

Code : 23GE3GS03 **Credit: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I: POETRY **12 Hours**

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

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

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

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

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

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

Articles, Determiners and Quantifiers

Linking Words/ Connectives

Compound Words

Direct and Reported Speech

UNIT V: LANGUAGE COMPETENCY

Writing letters and emails

Writing in Social media platforms

[Blogs, X, Instagram, Facebook]

Learning etiquette and Email Etiquette **12 Hours**

COURSE BOOKS:

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

BOOKS FOR REFERENCE

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

WEB SOURCES

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

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

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

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

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

ELEMENTS OF MATHEMATICAL ANALYSIS

Semester: III **Hours: 5**

Code : 23MA3MC05 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of the fundamental concepts on sets, sequences and series	PSO-1	K1
CO - 2	Understand the concepts of real numbers	PSO-4	K2
CO - 3	Apply the continuity of functions in metric spaces	PSO-2	K3
CO - 4	Analyze the properties of convergence and divergence of sequences and series	PSO-3	K4
CO - 5	Solve the problems based on mathematical concepts with mathematical structures	PSO-5	K5

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

Semester: III				ELEMENTS OF MATHEMATICAL ANALYSIS								Hours: 5
Code : 23MA3MC05												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	4	3	3	3	3	5	3	3	3	4	3.55
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Sets and functions: Sets and elements - Operations on sets - functions - real valued functions - equivalence - countability - real numbers - least upper bounds.

(15 Hours)

UNIT II

Sequences of real numbers: Definition of a sequence and subsequence -limit of a sequence - convergent sequences-divergent sequences- bounded sequences - monotone sequences. **(15 Hours)**

UNIT III

Operations on convergent sequences - operations on divergent sequences- limit superior and limit inferior - Cauchy sequences. **(15 Hours)**

UNIT IV

Series of Real Numbers: Convergence and divergence - Series with nonnegative terms-Alternating series - Conditional convergence and absolute convergence-tests for absolute convergence. **(15 Hours)**

UNIT V

Limits and Metric Spaces: Limit of a function on the real line - Metric spaces - Limits in metric spaces - Continuous functions on metric spaces: Functions continuous at a point on the real line - Functions continuous on a metric space.

(15 Hours)

COURSE BOOK:

- Richard R. Goldberg, Methods of Real Analysis, CBS Publishers & Distributors Pvt. Ltd., 2017.

Unit I	:	Chapter 1: Sections 1.1 - 1.7
Unit II	:	Chapter 2: Sections 2.1 - 2.6
Unit III	:	Chapter 2: Sections 2.7 - 2.10
Unit IV	:	Chapter 3: Sections 3.1 - 3.4 & 3.6
Unit V	:	Chapter 4: Sections 4.1 - 4.3 Chapter 5: Sections 5.1 & 5.3

BOOKS FOR REFERENCE:

1. T. M. Apostol, Calculus (Vol. I), John Wiley and Sons (Asia) Pvt. Ltd., 2002.
2. R.G. Bartle and D. R Sherbert, Introduction to Real Analysis, John Wiley and Sons (Asia) P. Ltd., 2000.
3. E. Fischer, Intermediate Real Analysis, Springer Verlag, 1983.
4. K.A. Ross, Elementary Analysis, The Theory of Calculus Series, Undergraduate Texts in Mathematics, Springer Verlag, 2003.

E-RESOURCES:

1. https://ocw.mit.edu/courses/18-100a-real-analysis-fall-2020/download/
2. https://onlinecourses.nptel.ac.in/noc21_ma04/preview

DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS

Semester: III **Hours: 5**

Code : 23MA3MC06 **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 to classify differential equations	PSO-1	K1
CO - 2	Understand the standard forms in differential equation	PSO-4	K2
CO - 3	Apply appropriate methods to solve differential equations	PSO-2	K3
CO - 4	Analyze the ordinary and partial differential equations	PSO-5	K4
CO - 5	Create mathematical models of real life problem	PSO-3	K5

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

Semester: III				DIFFERENTIALEQUATIONS AND ITS APPLICATIONS								Hours: 5
Code : 23MA3MC06												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	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	5	3	3	3	3	3	3	3	3	5	3.36
CO - 5	3	3	5	3	3	3	3	3	5	3	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

Equations of the first order and of the first degree: Variables separable - Homogeneous equations - Non-homogeneous equations of first degree in two variables - Linear equation - Bernoulli's equation - Exact differential equations.

(15 Hours)

UNIT II

Equations of first order but of higher degree: Equations solvable for dy/dx-equations solvable fory-equations solvable for x-Clairaut's form - Equations that do not contain y explicity - linear equation with constant coefficients - particular integral of algebraic, exponential, trigonometric functions and their products.

(15 Hours)

UNIT III

Simultaneous differential equations: Linear equations of the second order - Complete solution given a known integral - Reduction to the normal form - change of the independent variable -variation of parameters. **(15 Hours)**

UNIT IV

Classification of integrals - Partial differential equations - derivation of the first order of PDE by eliminating arbitrary constants and arbitrary functions - singular integral - general integral - Lagrange's method of solving the linear equations.

(15 Hours)

UNIT V

Special methods - standard forms - Charpit's methods - The vibrating string.

(15 Hours)

COURSE BOOK:

- S. Narayanan & T.K. Manickavasagom Pillay, Differential Equations and its Applications, published by Divya Subramanian for Ananda Book Depot, 2018.

Unit I	:	Chapter 2 : Sections 1 - 6
Unit II	:	Chapter 4 : Sections 1-4
		Chapter 5 : Sections 1-4
Unit III	:	Chapter 6 : Sections 1- 6
		Chapter 8 : Sections 1- 4
Unit IV	:	Chapter 12: Sections 1- 4
Unit V	:	Chapter 12: Sections 5 & 6
		Chapter 13: Sections 1 - 4

BOOKS FOR REFERENCE:

1. Shepley L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, 1984.
2. I. Sneddon, Elements of Partial Differential Equations, McGraw-Hill, International Edition, 1967.
3. G.F. Simmons, Differential equations with Applications and Historical Notes, 2nd Edition, Tata Mcgraw Hill Publications, 1991.

E-RESOURCE:

1. https://archive.nptel.ac.in/courses/111/108/111108081/

MATHEMATICAL STATISTICS

Semester: III **Hours: 5**

Code : 23MA3AC3A **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of the data collection	PSO - 1	K1
CO - 2	Interpret the statistical data using elementary statistical method.	PSO - 4	K2
CO - 3	Apply different distributions to solve statistical problems	PSO - 2	K3
CO - 4	Analyze various generating functions	PSO - 5	K4
CO - 5	Solve real life problems	PSO - 3	K5

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

Semester: III				**MATHEMATICAL STATISTICS**							**Hours: 5**
Code : 23MA3AC3A											**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	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	5	3	3	3	3	3	3	3	3	5	3.36
CO - 5	3	3	5	3	3	3	3	3	5	3	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

Central Tendencies: Introduction - Arithmetic mean - Partition values (median, quartiles, deciles and percentiles) - Mode - Geometric mean and Harmonic mean - Measures of dispersion. **(15 Hours)**

UNIT II

Moments Skewness and Kurtosis: Curve fitting - Introduction - Principle of least squares - fitting a straight line - fitting a second degree parabola.

(15 Hours)

UNIT III

Correlation and Regression: Introduction – Correlation - Rank correlation - Regression - Correlation coefficient for a bivariate frequency distribution - Probability: Probability - Conditional probability. **(15 Hours)**

UNIT IV

Random variables: Random variables - discrete random variable - continuous random variable - Mathematical expectations - Moment generating function - Characteristic function. **(15 Hours)**

UNIT V

Some special distributions: Binomial distribution - Poisson distribution - Normal distribution - some more continuous distributions. **(15 Hours)**

COURSE BOOK:

- S. Arumugam and A. Thangapandi Issac, Statistics, New Gamma Publishing House, Palayamkottai, 2015.

  Unit I : Chapter 2: Sections 2.0-2.4
  Chapter 3: Section 3.1
  Unit II : Chapter 4: Sections 4.1 & 4.2
  Chapter 5: Sections 5.0 & 5.1
  Unit III : Chapter 6: Sections 6.0-6.4
  Chapter 11: Sections 11.1&11.2
  Unit IV : Chapter 12: Sections 12.1-12.6
  Unit V : Chapter 13: Sections 13.1-13.4

BOOK FOR REFERENCE:

- D. N. Elhance, VeenaElhance and B. M. Aggarwal, Fundamentals of Statistics, Seventh Edition, Sultan Chand & Sons, 2009.

E-RESOURCE:

1. https://nptel.ac.in/courses/110107114

COMBINATORIAL MATHEMATICS

Semester: III **Hours: 5**

Code : 23MA3AC3B **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of combinatorial number system	PSO-1	K1
CO - 2	Understand the concepts of problems on blocks and designs	PSO-4	K2
CO - 3	Apply inclusion and exclusion principles in multi nomials	PSO-2	K3
CO - 4	Analyze recurrence relations and symmetric functions	PSO-5	K4
CO - 5	Criticize combinatorial techniques in real life problems	PSO-3	K5

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

Semester: III				**COMBINATORIAL MATHEMATICS**							**Hours: 5**
Code : 23MA3AC3B											**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	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	5	3	3	3	3	3	3	3	3	5	3.36
CO - 5	3	3	5	3	3	3	3	3	5	3	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

Selections and Binomial coefficients: Permutations - ordered selections - unordered selections - miscellaneous problems. **(15 Hours)**

UNIT II

Pairings problems: pairings within a set - pairings between sets. **(15 Hours)**

UNIT III

Recurrence - Fibonacci - types relations using generating functions - miscellaneous methods. **(15 Hours)**

UNIT IV

The inclusion - exclusion principles - The principle-Rook polynomials. **(15 Hours)**

UNIT V

Block designs - Square block designs. **(15 Hours)**

COURSE BOOK:

- Ian Andersen, A first course in Combinatorial Mathematics, Clarendon Press, Oxford, Second Edition, 1989.

Unit I	:	Chapter 2: Sections 2.1 - 2.3&2.5
Unit II	:	Chapter 3: Sections 3.1 - 3.2
Unit III	:	Chapter 4: Sections 4.2 - 4.4
Unit IV	:	Chapter 5: Sections 5.1 - 5.2
Unit V	:	Chapter 6 : Sections 6.1 - 6.2

BOOKS FOR REFERENCE:

1. C. L. Liu, Introduction to Combinatorial Mathematics, McGraw Hill Publishers, 1968.
2. V. Krishnamurthy, Combinatorics, Theory and Applications, Affiliated East-West Press Pvt. Ltd., 1985.

E-RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc23_ma58/preview
2. https://scholarship-positions.com/combinatorial-mathematics-online-course-tsinghua-university/2015/09/22/

LaTeX - Lab

Semester: III **Hour: 1**

Code : 23SE3MA03 **Credit:1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire knowledge of LaTeX	PSO-4	K1
CO - 2	Understand the syntax and structure for effective document formatting	PSO-2	K2
CO - 3	Articulate complex ideas with clarity using LaTeX typesetting capabilities	PSO-1	K3
CO - 4	Correlate LaTeX skills with enhanced academic and professional document quality	PSO-3	K4
CO - 5	Foster collaborative research publications	PSO-5	K5

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

Semester: III				**LaTeX - Lab**							**Hours: 1**
Code : 23SE3MA03											**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	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	5	4	3	3	3	3	5	3	3	3	4	3.55
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

Introduction: Just what is LaTeX - Basics of LaTeX file Text, Symbols, and Commands: Command names and arguments - Environments - Declarations - Special characters. **(3 Hours)**

UNIT II

Document Layout and Organization: Document class - page style - parts of the document - table of contents. Displayed Text: Changing font - Centering and indexing - Lists - Generalized list – Theorem - like declarations - Tabulator stop - Boxes - Tables. **(3 Hours)**

UNIT III

Mathematical Formulas: Mathematical environment - main elements of math mode - Mathematical symbols - Additional elements graphics inclusion and color: The graphics package - adding color. **(3 Hours)**

UNIT IV

User Customization: Counters - lengths - User defined commands - User defined environment. Document Management: Processing parts of documents - In-text references - Bibliographies. **(3 Hours)**

UNIT V

Multilingual LaTeX - The babel system - Math extensions with AMS LaTeX - Invoking AMS LaTeX - Standard features of AMS LaTeX - The AMS fonts - Letters - The LaTeX letter class. **(3 Hours)**

COURSE BOOK :

- H. Kopka and P.W.Daly, A Guide to LaTeX, Fourth Edition, Addison - Wesley, London, 1999.

Unit I:	Chapter 1 :	Sections 1.1 & 1.5
	Chapter 2 :	Sections 2.1 - 2.5
Unit II:	Chapter 3 & Chapter 4 :	Sections 4.1 - 4.8
Unit III:	Chapter 5:	Sections 5.1 - 5.4
	Chapter 6	
Unit IV:	Chapter 8 :	Sections 8.1 - 8.4
	Chapter 9 :	Sections 9.1 - 9.3
Unit V:	Chapter 11 :	Section 11.1
	Chapter 12 :	Sections 12.1, 12.2 & 12.4
	Chapter 16 :	Section 16.1

LaTeX-Lab PROGRAM LIST

1. Write a leave letter using LaTeX.
2. Write a multilingual text with different scripts using LaTeX.
3. Customize your own document using sections, subsections, different font size and different font effects.
4. Start a new section in the document. Using LaTeX type the following sentences
   i) I entered the room and - horrors - I saw both my father-in-law and my mother-in-law.
   ii) Frank wondered, "Is this a girl that can't say 'No!' ?"
5. Use itemize, enumerate and description environment to type the following content given below :

   1. You can mix list environments as much as you like
      • It might look unordered
      - With different symbols
   2. So do remember
      Stupid things will not become smart because they are in a list.
      Smart things, though, can be presented beautifully in a list.

6. Prepare the following table using LaTeX.

   Vegetable Production

Vegetable	Comments	Weight
Carrots	Fresh	7 kg.
Beans	Excellent	5 kg.
Spinach	Blanched	1 kg.

7. Write LaTeX code to type the following equations:
   i) 2+3+4+….+2n = n(n+1)
   ii) $\lim_{x\to 0}(1+x)^{1/x} = e$
   iii) $\int_0^1 3x^2\,dx = 1$
   iv) $\tan(2\theta) = \frac{2\tan\theta}{1-\tan^2\theta}$
   v) $\sum_{n=1}^{\infty} 2^{-n} = 1$
   vi) $(x+a)^n = \sum_{k=0}^{n} \binom{n}{k} x^k a^{n-k}$
   vii) $f(x) = a_0 + \sum_{n=1}^{\infty} \left(a_n \cos\frac{n\pi x}{L} + b_n \sin\frac{n\pi x}{L}\right)$

viii) $(1+x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \cdots$

ix) $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

x) $e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots, -\infty < x < \infty$

8. Add \usepackage {graphicx} in the preamble of your document. Write LaTeX code to import image and display it.
9. Write LaTeX code to type the following matrix format:

$$\begin{bmatrix} aa & \cdots & az \\ \vdots & \ddots & \vdots \\ za & \cdots & zz \end{bmatrix}$$

10. Use the environment "the bibliography" to produces a list of references. WriteLaTeX code to type the following example:

BOOKS FOR REFERENCE:

1. Michel Goossens, Frank Mittelbach and Alexander Samarin, The LaTeX Companion, Addison-Wesley, Reading, Massachusetts, 1993.
2. Albert Einstein, Zur Elektrodynamik ewegter Korper, (German) [On the Electrodynamics of moving bodies], Annalen der Phyaik, 322 (10) : 891-921, 1905.

E-RESOURCES:

1. http://www-cs-faculty.stanford.edu/uno/abcde.html.
2. https://www.overleaf.com/learn/letex/Tutorials

TECHNIQUES IN PROJECT SCHEDULING

Semester: III **Hours: 2**

Code : 23MA3GE01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge on the basic concepts of networks	PSO - 4	K1
CO - 2	Understand complex networks in graph theory	PSO - 5	K2
CO - 3	Analyze computations in networks through graphs.	PSO - 2	K3
CO - 4	ApplyCPM and PERT in network models	PSO - 1	K4
CO - 5	Reframe real life problem into net work models	PSO -3	K5

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

Semester: III				**TECHNIQUES IN PROJECT SCHEDULING**							**Hours: 2**
Code : 23MA3GE01											**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	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 2	3	5	3	3	3	3	3	3	3	3	5	3.36
CO - 3	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 4	5	4	3	3	3	3	5	3	3	3	4	3.55
CO - 5	3	3	5	3	3	3	3	3	5	3	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Introduction - Examples of Networks - Properties of Networks. **(6 Hours)**

UNIT II

Mathematics of Networks - Networks and their representation - The Adjacency Matrix - Weighted Networks - Directed Networks - Degree - Bipartite Networks - The Incidence Matrix - Planar Networks. **(6 Hours)**

UNIT III

Trees - Spanning Trees - The Minimum Spanning Tree Problem - Prim's Algorithm - Applications of Minimum Spanning Tree - Travelling Salesman Problem - Chinese Postman Problem. **(6 Hours)**

UNIT IV

PERT and CPM - Introduction - Basic Terminologies - Network Logic - Fulkerson's Rule - Construction of Networks. **(6 Hours)**

UNIT V

Critical Path Method - Slack and Float - Simple Problems. **(6 Hours)**

COURSE BOOK:

- Course material compiled by theDepartment .

BOOKS FOR REFERENCE:

1. Kanti Swarup, P. K. Gupta and Man Mohan, Operations Research, 20th Edition, Sultan Chand & Sons Publishers, 2022.
2. P. K. Gupta and D. S. Hira, Operations Research, S Chand & Company Limited, 2021.

E-RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc19_ma29/preview
2. https://onlinecourses.swayam2.ac.in/cec20_ma10/preview

PART IV - NATIONAL CADET CORPS

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

PROGRAMME SPECIFIC OUTCOMES (PSO)

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

GE - 1: NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT

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

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

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

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

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

Note:

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

Values Scaling:

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

GE-1: NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT

2hrs/Week

UNIT I

National Integration **6 Hours**

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

UNIT II

Civil Affairs **6 Hours**

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

UNIT III

Civil Defence and Self Defence **6 Hours**

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

UNI IV

Leadership And Personality Development **6 Hours**

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

UNIT V

Soft Skills **6 Hours**

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

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

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

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

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - 2023-2026

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

ABILITY ENHANCEMENT COURSE-3 (AEC-3)

ENVIRONMENTAL STUDIES

PROGRAMME OUTCOMES

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

PROGRAMME SPECIFIC OUTCOMES

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

AEC-3 - ENVIRONMENTAL STUDIES

Semester: III **Hours: 2**

Code : 23AE3ES03 **Credit: 2**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

FIELDWORK

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

COURSE BOOK:

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

UNIT I : Section - 1.3 to 1.37

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

UNIT III : Section - 3.1 to 3.37

UNIT IV : Section - 4.1 to 4.17

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

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

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

Note:

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

(ii) UNIT-V materials prepared by Staff

Continuous Internal Assessment Component (CIA)

Theory:

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

Continuous Internal Assessment Component (CIA)

Passing Minimum: 40% out of 100

Internal Question Pattern

Part - A

10 Questions × 1Mark =10 Marks

Part - B

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

Part - C

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

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

பொதுத் தமிழ் - 4

(பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: நான்கு **நேரம்: 6**

குறியீடு: 23GT4GS04 **புள்ளி: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

அலகு 1: எட்டுத் தொகை

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

அலகு 2: பத்துப் பாட்டு

நெடுநல்வாடை - நக்கீரர் **18 Hours**

அலகு 3: நாடகம்

சபாபதி - பம்மல் சம்பந்த முதலியார் **18 Hours**

அலகு 4: இலக்கிய வரலாறு

பாடம் தழுவிய இலக்கிய வரலாறு **18 Hours**

அலகு 5: மொழித்திறன்

மொழிபெயர்ப்பு / கலைச்சொற்கள்

கொடுக்கப்பட்டுள்ள ஆங்கிலப் பகுதியைத் தமிழில் மொழிபெயர்த்தல்.

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

பாட நூல்கள்

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

பார்வை நூல்கள்

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

General Essay, Translation and Letter Writing, Alankar

Semester: IV **Hours: 5**

Code : 23GH4GS04 **Credit: 3**

COURSE OUTCOMES:

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

UNIT I **(15 Hours)**

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

UNIT II **(15 Hours)**

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

UNIT III **(15 Hours)**

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

UNIT IV **(15 Hours)**

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

UNIT V **(15 Hours)**

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

COURSE BOOKS:

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

The follo wing Sahityotar (General) essay have been prescribed

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

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

The following Alankar have been prescribed

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

BOOKS FOR REFERENCE:

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

The following topics have been prescribed

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

COMMUNICATIVE ENGLISH - IV

Semester: IV **Hours: 4**

Code : 23GE4GS04 **Credit: 3**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I: POETRY **12 Hours**

Dahlia Ravikovitch - "Pride"

Maya Angelou - "Phenomenal Woman"

William Wordsworth - " The Tables Turned"

UNIT II: LIFE STORY **12 Hours**

Adeline Yen Mah - From *Chinese Cinderella*

George Orwell - "Why I Write"

UNIT III: SHORT STORY **12 Hours**

O Henry - "A Retrieved Reformation"

Extract from a play

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

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

UNIT IV: GRAMMAR **12 Hours**

Types of Sentences

Question Tags

UNIT V: DRAFTING **12 Hours**

Reading Comprehension

Book Review

Product Review

Resume Writing

COURSE BOOKS

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

BOOKS FOR REFERENCE

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

WEB SOURCES:

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

MECHANICS

Semester: IV **Hours: 5**

Code : 23MA4MC07 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Grasp the fundamental concepts of Mechanics	PSO - 2	K1
CO - 2	Compare and contrast principles related to coplanar forces	PSO - 3	K2
CO - 3	Apply conditions of equilibrium to solve real life problems	PSO - 1	K3
CO - 4	Analyze various principles and laws in Mechanics	PSO - 5	K4
CO - 5	Evaluate the equilibrium conditions of forces	PSO - 4	K5

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

Semester: IV				**MECHANICS**							**Hours: 5**
Code : 23MA4MC07											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 2	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 3	5	4	3	3	3	3	5	3	3	3	4	3.55
CO - 4	3	5	3	3	3	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

Forces acting at a point: Resultant and Components - Simple cases of finding the resultant - Parallelogram law of forces - Analytical expression for the resultant of two forces acting at a point - Triangle of forces - Perpendicular Triangle of forces - Converse of the Triangle of forces - The Polygon of forces - Lami'stheorem - An extended form of the parallelogram law of forces - Resolution of a force - Components of a force along two given directions - Theorem on Resolved parts. **(15 Hours)**

UNIT II

Parallel forces and Moments: Introduction - Resultant of two like parallel forces acting on a rigid body - Resultant of two unlike and unequal parallel forces acting on a rigid body - Resultant of a number of parallel forces acting on a rigid body - Conditions of equilibrium of three coplanar parallel forces - Moment of a force - center of two parallel forces - Physical significance of the moment of a force - Geometric representation of a moment - sign of the moment - Unit of moment - Varignon's theorem of moments - Generalised theorem of moments. **(15 Hours)**

UNIT III

Couples - Equilibrium of two couples - Equivalence of two couples - Couples in parallel planes - Representation of a couple by a vector - Resultant of coplanar couples - Resultant of a couple and a force. **(15 Hours)**

UNIT IV

Projectiles: Definitions - Two fundamental principles - Path of a projectile is a parabola - Characteristics of the motion of a projectile - A path described by a particle is projected horizontally from a point at a certain height above the ground - Maximum horizontal range - Velocity of the projectile at the end of time t - Range on an inclined plane. **(15 Hours)**

UNIT V

Simple Harmonic Motion: Simple harmonic motion in a straight line - General solution of the S.H.M. equation - Geometrical representation - change of origin - Composition of two simple harmonic motions of the same period and in the same straight line - Composition of two simple harmonic motions of the same period and in two perpendicular directions. **(15 Hours)**

COURSE BOOKS:

1. M. K. Venkatraman, Statics, Agasthiar Publications 12th Edition, 2007.
2. M. K. Venkatraman, Dynamics, Agasthiar Publications 13th Edition, 2009.

Unit I	:	Chapter 2: Sections 1 - 13 (Book 1)
Unit II	:	Chapter 3: Sections 1 -13 (Book 1)
Unit III	:	Chapter 4: Sections 1 -10 (Book 1)
Unit IV	:	Chapter 6: Sections 1- 12 (Book 2)
Unit V	:	Chapter10: Sections 1-7 (Book 2)

BOOK FOR REFERENCE:

- S. L. Loney, The Elements of Statics and Dynamics Part - I, Wiley Publishers. 2008.

E-RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc24_ph15/preview
2. https://onlinecourses.nptel.ac.in/noc24_ph10/preview

TRANSFORM TECHNIQUES

Semester: IV **Hours: 4**

Code : 23MA4MC08 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of various transforms	PSO - 1	K1
CO - 2	Understand the concepts of transforms	PSO - 4	K2
CO - 3	Solve differential equations using transforms	PSO - 2	K3
CO - 4	Devise the appropriate transform to find solutions of differential equations	PSO - 5	K4
CO - 5	Summarize the applications of transforms	PSO - 3	K5

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

Semester: IV				**TRANSFORM TECHNIQUES**							**Hours: 4**
Code : 23MA4MC08											**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	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	5	3	3	3	3	3	3	3	3	5	3.36
CO - 5	3	3	5	3	3	3	3	3	5	3	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

The Laplace transforms :Results - Laplace transform of periodic functions - Some general theorems - Evaluation of integral using Laplace transform. **(12 Hours)**

UNIT II

The Inverse transform - Problems on inverse Laplace transforms - solving ordinary differential equations with constant coefficient using Laplace transform - solving system of differential equations using Laplace transform - solving differential equations with variable coefficients using Laplace transform. **(12 Hours)**

UNIT III

Fourier Series: Introduction - Periodic functions - Fourier series - full range - fourier series - Half Range - Fourier series - Arbitrary range. **(12 Hours)**

UNIT IV

Fourier Transform: Introduction - Integral transforms - Fourier cosine and sine integral - Fourier transform - properties of Fourier transforms - Solution of differential equations by Fourier transform. **(12 Hours)**

UNIT V

Fourier Sine and Cosine Transform: Fourier cosine transform - Fourier sine transform - properties of Fourier cosine and sine transforms. **(12 Hours)**

COURSE BOOKS:

1. S. Narayanan & T. K. Manickavasagom Pillay, Differential Equations and its Applications, S. Viswanathan(Printers & Publishers) Pvt. Ltd., 2011.
2. Dr. S. Arumugam & Dr.A.ThangapandiIssac, Trigonometry Fourier Series & Laplace Transformation , New Gamma Publishing House, Palayamkottai, 2017.
3. K.Vairamanikam, Nirmala P. Ratchagar and S. Tamilselvan, Transforms and Partial Differential Equations, Scitech Publications India Pvt. Ltd., 2012.

Unit I	:	Chapter 9: Sections 1- 5 (Book 1)
Unit II	:	Chapter 9 : Sections 6 -10 (Book 1)
Unit III	:	Chapter 4 : Sections 4.0 - 4.4(Book 2)
Unit IV	:	Chapter 2 : Sections 2.1 - 2.6(Book 3)
Unit V	:	Chapter 2 : Sections 2.7 - 2.9 (Book 3)

BOOK FOR REFERENCE:

- T. Veerarajan, Transforms and Partial Differential Equations (First Edition Updated), Tata McGraw Hill Education Pvt. Ltd., 2013.

E-RESOURCE:

1. https://archive.nptel.ac.in/courses/111/106/111106111/

STATISTICS WITH R

Semester: IV **Hours: 5**

Code : 23MA4AC4A **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 R studio	PSO-1	K1
CO - 2	Understand the use of R programming in statistical analysis	PSO-4	K2
CO - 3	Set and test the hypothesis	PSO-3	K3
CO - 4	Analyze the characteristics of samples	PSO - 5	K4
CO - 5	Criticize the statistical data	PSO -2	K5

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

Semester: IV				STATISTICS WITH R							Hours: 5
Code : 23MA4AC4A											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	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 3	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 4	3	5	3	3	3	2	3	3	3	3	5	3.36
CO - 5	3	3	3	5	3	3	3	5	3	3	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Introduction - History - How to install R - Download - Install - Configure - The basic Algebra - Vectors - Matrices - Manipulation - Loop Statement - Basic Arithmetic, Generating data - basic Statistics. **(15 Hours)**

UNIT II

Sampling - Sampling distribution - Testing of hypothesis - Procedure for testing of hypothesis for large samples - Tests of significance for large samples.

(15 Hours)

UNIT III

Test of significance based on t-distribution (t - test) - Test of significance based on F-test - Test for significance of an observed sample correlation - one sample t-test on R Program-two samplet - test on R Program. **(15 Hours)**

UNIT IV

Test based on χ^2 -distribution - χ^2 -test – Introduction - χ^2-test to test the goodness of fit-χ^2-test for independence of attributes - χ^2-test on R program. **(15 Hours)**

UNIT V

Analysis of Variance - One criterion of classification - Two criteria of classification - Three criteria of classification - Latin Square - ANOVA test on R Program. **(15 Hours)**

COURSE BOOK:

- Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. Dr. S. Arumugam, Dr. A. Thangapandian Isaac, Statistics, New Gamma Publishing House, 2018.
2. Jared P. Lander, R for Everyone Advanced Analytics and Graphics, Pearson, 2016.
3. D. C. Sancheti, V.K. Kapoor, Statistics (Theory, Methods and Application), Sultan Chand & Sons, 2019.

E- RESOURCE:

1. https://www.coursera.org/specializations/statistics?isNewUser=true

INTEGRAL TRANSFORMS AND Z -TRANSFORMS

Semester: IV **Hours: 5**

Code : 23MA4AC4B **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify partial differential equations	PSO- 1	K1
CO - 2	Understand PDE and Z-transforms	PSO-4	K2
CO - 3	Apply transform techniques to solve problems	PSO-2	K3
CO - 4	Connect Z-transform, PDE and difference equations	PSO-5	K4
CO - 5	Reframe real life problems	PSO-3	K5

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

Semester: IV				INTEGRAL TRANSFORMS AND Z - TRANSFORMS							Hours: 5
Code : 23MA4AC4B											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	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	5	3	3	3	3	3	3	3	3	5	3.36
CO - 5	3	3	5	3	3	3	3	3	5	3	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Applications of partial differential equations: Introduction - basic concepts and definitions - classification of general second order linear PDE - applications - derivation of the wave equation - solution of the wave equation - Method I: Separation at variables technique - Method II: D'Alembert's solution of wave equation. **(15 Hours)**

UNIT II

One dimensional heat equations - derivation of the one-dimensional heat equation - solution of the heat equation - Type - I: Zero boundary conditions - Type - II: Steady state conditions and zero boundary conditions. **(15 Hours)**

UNIT III

Z-Transforms: Definition - Z-transforms of some basic functions. **(15 Hours)**

UNIT IV

Inverse Z-Transforms - Method I: using Convolution theorem - Method II: Long division method - Method III: using Cauchy's residue theorem - Method IV: Partial fractions method. **(15 Hours)**

UNIT V

Applications of Z-transform in solving finite difference equations. **(15 Hours)**

COURSE BOOK:

- K. Vairamanikam, Nirmala P. Ratchagar and S. Tamilselvan, Transforms and Partial Differential Equations, Scitech Publications India Pvt. Ltd., 2012.

Unit I	:	Chapter 4: 4.1 - 4.6
Unit II	:	Chapter 4: 4.7 (up to Example: 4.22)
Unit III	:	Chapter 5: 5.1 - 5.2
Unit IV	:	Chapter 5: 5.3 - 5.7
Unit V	:	Chapter 5: 5.8

BOOK FOR REFERENCE:

1. T. Veerarajan, Transforms and Partial Differential Equations, McGraw Hill Education Pvt. Ltd., Third Edition, 2013.

E-RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc22_ma51/preview
2. https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_pg/1566

STREAM B - 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

UNIT I

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)

UNIT V

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, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2001.
3. B. Ram, Computer Fundamentals, 3rd Edition, New Age International Pvt. Ltd., 2010.

E- RESOURCE:

1. https://onlinecourses.swayam2.ac.in/cec19_mg35/preview

MATHEMATICS FOR LIFE

Semester: IV **Hours: 2**

Code : 23MA4GE02 **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 of real life problems	PSO - 4	K1
CO - 2	Understand mathematical principles	PSO - 2	K2
CO - 3	Solve mathematical problems in practical scenarios	PSO - 1	K3
CO - 4	Analyze the graphs	PSO - 3	K4
CO - 5	Appraise the utilization of mathematical principles in various domains	PSO - 5	K5

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

Semester: IV						**MATHEMATICS FOR LIFE**					**Hours: 2**
Code : 23MA4GE02											**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	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	5	4	3	3	3	3	5	3	3	3	4	3.55
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Average: Average of prime numbers - even numbers - average speed - average weight. Time and Distance: Speed - time - Distance - Simple problems- Ratio and Proportion: Ratio of two quantities - finding third proportion - fourth proportion - comparison - duplicate ratio. **(6 Hours)**

UNIT II

Percentage: Express percentage as fraction, decimal - problems on population depreciation - Interest: Simple interest - Compound interest- amount - compound interest calculated annually, half yearly, quarterly. **(6 Hours)**

UNIT III

Problems on numbers: Problems on difference between two numbers - consecutive numbers (simple problems) - Time and work: Time - work- simple problems - Permutations and Combinations: Permutations - Number of permutations- Combinations - Number of combinations. **(6 Hours)**

UNIT IV

Profit and Loss: Profit - Loss - cost price - selling price-profit percent- loss percent- Directions: Problems on directions - Probability : Random Experiment-Sample space - Event - Probability of occurrence of an event-Data interpretation: Tabulation, bar graphs, pie charts, line graphs. **(6 Hours)**

UNIT V

Calendar: Leap year - ordinary year - odd days - clock - Problems on ages: Calculating the age with the given data - partnership - blood relations. **(6 Hours)**

COURSE BOOK:

- Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. R. Gopal and V. Subramanyam, Arithmetic and Quantitative Aptitude for Competitive Examinations, Sura College of Competition, 2018.
2. R. S. Aggarwal and S. Chand, Quantitative Aptitude and Company Ltd., New Delhi, 2009.
3. R. S. Aggarwal and S. Chand, A Modern Approach to Verbal & Non - Verbal Reasoning, S. Chand and Company Ltd. New Delhi, 2008.

E-RESOURCE:

1. https://www.indiabix.com/

GE-2: ORGANIZATION AND HEALTH PROGRAMME IN NCC

Semester: IV **Hours: 2**

Code : 23GE4NC02 **Credit: 2**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

GE-2: ORGANIZATION AND HEALTH PROGRAMME IN NCC

2hrs/Week

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

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

UNIT II: Map Reading **6 Hours**

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

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

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

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

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

UNIT V: First Aid **6 Hours**

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

BOOK FOR REFERENCE:

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

ABILITY ENHANCEMENT COURSE-4 (AEC-4)

CAPACITY BUILDING

PROGRAMME OUTCOMES

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

PROGRAMME SPECIFIC OUTCOMES

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

CAPACITY BUILDING

Semester: IV **Hours: 1**

Code : 23AE4CB04 **Credit: 1**

COURSE OUTCOMES:

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

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

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

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

Note:

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

Values Scaling:

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

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

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

BOOKS FOR REFERENCE:

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

Continuous Internal Assessment Component (CIA)

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

ABSTRACT ALGEBRA

Semester: V **Hours: 5**

Code : 23MA5MC09 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of the basic algebraic structures	PSO - 1	K1
CO - 2	Compare the concepts of various algebraic structures	PSO - 4	K2
CO - 3	Relate the properties of algebraic structure	PSO - 3	K3
CO - 4	Illustrate algebraic structures	PSO - 2	K4
CO - 5	Summarize the properties of groups and extend rings and fields	PSO - 5	K5

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

Semester: V				ABSTRACT ALGEBRA								Hours: 5
Code : 23MA5MC09												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	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 3	3	3	5	3	3	3	3	3	5	3	3	3.36
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

UNIT I

Introduction to groups - subgroups - cyclic groups - a counting principle - examples. **(15 Hours)**

UNIT II

Normal subgroups and Quotient groups - Homomorphism - examples.

(15 Hours)

UNIT III

Automorphism - Cayley's theorem - Permutation groups - examples.

(15 Hours)

UNIT IV

Definition and examples of ring - Some special classes of rings - Homomorphism of rings - ideals and quotient rings - more ideals and quotient rings. **(15 Hours)**

UNIT V

The field of quotients of an integral domain - Euclidean rings - The particular Euclidean ring - examples. **(15 Hours)**

COURSE BOOK:

- I.N. Herstein, Topics in Algebra, Wiley Eastern Ltd., Second Edition, 2016.

Unit I	:	Chapter 2	:	Sections: 2.1-2.5
Unit II	:	Chapter 2	:	Sections: 2.6 - 2.7
Unit III	:	Chapter 2	:	Sections: 2.8 - 2.10
Unit IV	:	Chapter 3	:	Sections: 3.1 - 3.5
Unit V	:	Chapter 3	:	Sections: 3.6 - 3.8

BOOKS FOR REFERENCE:

1. John B. Fraleigh, A First Course in Abstract Algebra, 7th Edition, Pearson, 2002.
2. M. Artin, Abstract Algebra, 2nd Edition, Pearson, 2011.
3. Joseph A Gallian, Contemporary Abstract Algebra, 4th Edition, Narosa, 1999.

E-RESOURCE:

1. https://nptel.ac.in/courses/111106113

REAL ANALYSIS

Semester: V **Hours: 6**

Code : 23MA5MC10 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of sets and functions	PSO-2	K1
CO - 2	Understand the concept of metric spaces	PSO-4	K2
CO - 3	Relate the behavior of metric spaces with respect to functions	PSO-3	K3
CO - 4	Analyze the characteristics of metric spaces	PSO-5	K4
CO - 5	Signify the concepts of real analysis in reality	PSO-1 PSO-3	K5

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

Semester: V				**REAL ANALYSIS**							**Hours: 6**
Code : 23MA5MC10											**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 2	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 3	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 4	3	5	3	3	3	3	3	3	3	3	5	3.36
CO - 5	5	3	5	3	3	3	5	3	5	3	3	3.72
Overall Mean Score												**3.43**

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

Note:

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

Values Scaling:

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

UNIT I

Continuous Functions on Metric Spaces: Open sets - Closed sets - Discontinuous function on R^1. **(18 Hours)**

UNIT II

Connectedness, Completeness and Compactness: More about open sets - connected sets. bounded sets and totally bounded sets - Complete metric spaces. **(18 Hours)**

UNIT III

Compact metric spaces - continuous functions on compact metric space - continuity of the inverse functions - uniform continuity. **(18 Hours)**

UNIT IV

Derivatives: Rolle's theorem- The law of mean-Fundamental theorems of Calculus-Taylor's theorem. **(18 Hours)**

UNIT V

Pointwise convergence of sequences of functions - uniform convergence of sequences of functions. **(18 Hours)**

COURSE BOOK:

- **Richard R. Goldberg,** Methods of Real Analysis, Indian Edition, Oxford and IBH Publishing Co., New Delhi, 2017.

Unit I	:Chapter 5 :	Sections 5.4 - 5.6
Unit II	:Chapter 6:	Sections 6.1-6.4
Unit III	:Chapter 6 :	Sections 6.5- 6.8
Unit IV	:Chapter 7:	Sections 7.5 -7.8
	Chapter 8 :	Section 8.5
Unit V	:Chapter 9:	Sections 9.1 -9.2

BOOK FOR REFERENCE:

- S.Arumugam and A. Thangapandi Issac, Modern Analysis, New Gamma Publishing House, 2010.

E - RESOURCE:

1. https://digitalcommons.trinity.edu/cgi/viewcontent.cgi?article=1006&context=mono

PROGRAMMING IN C++ - THEORY

Semester: V **Hours: 4**

Code : 23MA5MC11 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge C++ programming	PSO -3	K1
CO - 2	Understand the basic structure and programming style in C++	PSO - 4	K2
CO - 3	Apply different operators in programming	PSO - 2	K3
CO - 4	Illustrate virtual functions, constructors and destructors	PSO-5	K4
CO - 5	Write programs for the given task using C++	PSO-1	K5

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

Semester: V				PROGRAMMING IN C++ - THEORY								Hours: 4
Code : 23MA5MC11												Credit: 4
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	3	3	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	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 4	3	5	3	3	3	3	3	3	3	3	5	3.36
CO - 5	5	4	3	3	3	3	5	3	3	3	4	3.55
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

Principles of Object-Oriented Programming: Object-Oriented programming Paradigm - Basic Concepts of Object Oriented Programming - Benefits of OOP – Object - Oriented Languages. Beginning with C++: Structure of C++ program. Tokens, Expressions and Control Structures: Introduction - tokens - keywords - identifiers and constants - basic data types - user-defined data types - storage classes - derived data types - symbolic constants - type compatibility - declaration of variables - dynamic instillation of variables - reference variables - operators in C++ - scope resolution operator - member dereferencing operators - memory management operators - manipulators - type cast operator - expressions and their types - special assignment expressions - implicit conversions - operator overloading - operator precedence - control structures. **(12 Hours)**

UNIT II

Functions in C++: Introduction - The Main Function - Function Prototyping - Call by Reference - Return by Reference - Inline Functions - Default Arguments - const Arguments - Recursion - Function Overloading - Friend and Virtual Functions - Math Library Functions. Classes and Objects: Defining Member Functions - C++ Program with Class - Making an Outside Function Inline - Nesting of Member Functions - private member functions - arrays within a class - memory allocation for objects - static data members - static member functions - arrays of objects - objects as function arguments - friendly functions. **(12 Hours)**

UNIT III

Constructors and Destructors: Introduction - Constructors - Parameterized Constructors - Multiple Constructors in a Class - Constructors with Default Arguments - Dynamic initialization of objects - Copy Constructor - Dynamic constructors - constructing two-dimensional arrays - const objects - Destructors. **(12 Hours)**

UNIT IV

Operator Overloading and Type conversions: Introduction - defining operator overloading - overloading unary operators - overloading binary operators - overloading binary operators using friend - manipulation of strings using operators. Inheritance: Extending Classes: Introduction - defining derived classes - single inheritance - making a private inheritable - multilevel inheritance - multiple inheritance - hierarchical inheritance - hybrid inheritance - virtual base classes - abstract classes. **(12 Hours)**

UNIT V

Pointers, Virtual Functions and Polymorphism: Introduction - pointers - pointers to objects - this pointer - polymorphism - pointers to derived classes - virtual functions - pure virtual functions - virtual constructors and destructors. Working with Files: Introduction - classes for file stream operations - opening and closing a file - detecting end-of-file. **(12 Hours)**

COURSE BOOK:

- E. Balagurusamy, Object-Oriented Programming with C++, 8th Edition, McGraw Hill Education Pvt. Ltd., 2021.

Unit I	: Chapter 1 : Sections 1.4 -1.7
	Chapter 2: Section 2.6
	Chapter 3 : Sections 3.1- 3.25
Unit II	: Chapter 4 : Sections 4.1- 4.12
	Chapter 5: Sections 5.4 - 5.15
Unit III	: Chapter 6: Sections 6.1 - 6.11
Unit IV	: Chapter 7: Sections 7.1 - 7.6
	Chapter 8 : Sections 8.1- 8.10
Unit V	: Chapter 9: Sections 9.1- 9.9
	Chapter 11: Sections 11.1- 11.4

BOOKS FOR REFERENCE:

1. John R.Hubbard, Schaum's Outlines Series: programming with C++, McGraw Second Edn, 2000.
2. Bjarne Stroustrup, The C++ programming Language, Pearson Education, 4th Edn, 2022.

E-RESOURCES:

1. https://onlinecourses.swayam2.ac.in/aic20_sp06/preview
2. https://www.mygreatlearning.com/academy/learn-for-free/courses/introduction-to-c

PROGRAMMING IN C++ - LAB

Semester: V **Hours: 2**

Code : 23MA5CP01 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify errors in the given program	PSO-1	K1
CO - 2	Use decision making and looping statements in writing a C++ program	PSO-2	K2
CO - 3	Change the control structures to construct a C++ program	PSO-3	K3
CO - 4	Utilize arrays to write a C++ program	PSO-4	K4
CO - 5	Develop C++ program for the given real-life problem	PSO-5	K5

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

Semester: V				**PROGRAMMING IN C++ - LAB**							**Hours: 2**
Code : 23MA5CP01											**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	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	2	3	3	3	5	5	2	3	3	5	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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

LIST OF PRACTICALS:

1. Write a program to create a student details using class, object and function.
2. Write a program using class to maintain a bank account.
3. Write a program to print the Pascal's triangle using for loop.
4. Write a program to find the simple interest and compound interest.
5. Write a program to manipulate the string function.
6. Write a program to find the volume of a cube, cylinder, and cuboids using function overloading.
7. Write a program to multiply complex numbers using operator overloading.
8. Write a program to overload unary and binary operator.
9. Write a program to maintain library details using constructor and destructors.
10. Write a program to maintain employee details using single inheritance.
11. Write a program to find the result of students using the class student and test through multilevel inheritance.
12. Write a program to create a file to prepare mark statement.

GRAPH THEORY AND APPLICATIONS

Semester: V **Hours: 5**

Code : 23MA5MC12 **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 basics of graphs	PSO - 2	K1
CO - 2	Understand the concepts of planar graphs, directed graphs and colourings	PSO - 3	K2
CO - 3	Apply graph models to real life problems	PSO - 1	K3
CO - 4	Illustrate different graphs	PSO - 4 PSO - 2	K4
CO - 5	Convert real problems into network models	PSO-5	K5

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

Semester: V				GRAPH THEORY AND APPLICATIONS							Hours: 5
Code : 23MA5MC12											Credit: 4
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 2	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 3	5	4	3	3	3	3	5	3	3	3	4	3.55
CO - 4	2	3	3	5	5	5	2	5	3	5	3	3.72
CO - 5	3	5	3	3	3	3	3	3	3	3	5	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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Basics: Graphs - Pictorial representation - Subgraphs - Isomorphism and degrees - Walk and connected graphs - Cycles in graphs - Cut-vertices and Cut-edges. **(15 Hours)**

UNIT II

Eulerian and Hamiltonian graphs: Eulerian graphs - Fleury algorithm- Hamiltonian graphs - Weighted graphs - Bipartite graphs - Marriage Problem - Trees. **(15 Hours)**

UNIT III

Planar graphs: Euler formula - Platonic solids - Dual of a plane graph- Characterization of planar graphs - Colourings - Vertex colouring - Edge colouring – An algorithm for vertex colouring. **(15 Hours)**

UNIT IV

Directed Graphs: Connectivity in digraphs - Strong orientation of graphs - Eulerian digraphs - Tournament. **(15 Hours)**

UNIT V

Labellings: Predecessor and Successor - Algorithm - Graceful labelling - Sequential functions - Application - Magic graphs. **(15 Hours)**

COURSE BOOKS:

1. S.A. Choudum, A First Course in Graph Theory, Macmillan publishers India Ltd., 2011.
2. M. Murugan, Graph Theory and Algorithm, Muthali Publishing House, Chennai, First Edition, 2003.

Unit I	:	Chapter1: Sections 1.1-1.7(Book1)
Unit II	:	Chapter2: Sections 2.1-2.2 (omitting theorem 2.5), 2.3 & 2.4(Book1) Chapter3: Sections 3.1-3.3(Book1)
Unit III	:	Chapter5: Sections 5.1-5.5(Book1) (omitting theorem 5.7) Chapter6: Sections 6.1-6.3(Book1)
Unit IV	:	Chapter7: Sections 7.1-7.5(Book1)
Unit V	:	Chapter10: Sections 10.1-10.6(Book2)

BOOKS FOR REFERENCE:

1. S. Arumugam and S. Ramachandran, Invitation to Graph Theory, SCITECH. Publications India Pvt. Ltd., 2006
2. Robin J. Wilson, Introduction to graph theory, Longman, 2010.

E - RESOURCE:

1. https://archive.nptel.ac.in/courses/111/106/111106050/

FLUID DYNAMICS

Semester: V **Hours: 4**

Code : 23MA5DE1A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Illustrate the significance of streamlines and pathlines in fluid dynamics	PSO - 4	K1
CO - 2	Interpret the significance of vertex motion and its components	PSO - 1 PSO - 2	K2
CO - 3	Articulate the principles of Venturi tube to solve fluid flow challenges	PSO - 3	K3
CO - 4	Analyze the connection between Euler's equations and vertex motion	PSO - 2	K4
CO - 5	Evaluate the effectiveness of pitot tube application in various fluid scenario	PSO-5	K5

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

Semester: V							**FLUID DYNAMICS**					**Hours: 4**
Code : 23MA5DE1A												**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	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 2	5	3	3	5	3	3	5	5	3	3	3	3.72
CO - 3	3	3	5	3	3	3	3	3	5	3	3	3.36
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												**3.43**

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

Note:

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

Values Scaling:

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

UNIT I

Kinematics of Fluids in Motion: Real Fluids and Ideal Fluids - Velocity of a fluid particle at a point - Stream lines and Path lines - The velocity potential - the vorticity vector - local and particle rates of change - The equation of continuity - Acceleration of a fluid - conditions at a Rigid body. **(12 Hours)**

UNIT II

Equations of Motion of a Fluid - Euler's equations of motion - Bernoulli's equation - Boundary. **(12 Hours)**

UNIT III

Some Three dimensional flows: Introduction - sources - sinks and doublets - Images in a rigid infinite plane. **(12 Hours)**

UNIT IV

Axi - symmetric flows - Stokes stream functions. **(12 Hours)**

UNIT V

Some two dimensional flows: Meaning of two - dimensional flow - Use of cylindrical polar coordinates - The stream function - Complex potentials for standard Two - Dimensional flows. **(12 Hours)**

COURSE BOOK :

- F. Chorlton, Text Book of Fluid Dynamics, CBS Publishers & Distributors, 2004.

Unit I	:	Chapter 2 : Sections 2.1 - 2.10
Unit II	:	Chapter 3 : Sections 3.4 - 3.6
Unit III	:	Chapter 4 : Sections 4.1 - 4.3
Unit IV	:	Chapter 4 : Section 4.5
Unit V	:	Chapter 5 : Sections 5.1 - 5.3 & 5.5

BOOK FOR REFERENCE:

1. H. Kanwar, Fluid Dynamics, Mohindra Capital Publishers, 2023.

E-RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc24_ph07/preview
2. https://onlinecourses.nptel.ac.in/noc24_me26/preview

LINEAR PROGRAMMING

Semester: V **Hours: 4**

Code : 23MA5DE1B **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 of Linear Programming Problem	PSO - 3	K1
CO - 2	Understand the methods of optimization	PSO - 4	K2
CO - 3	Apply the optimization techniques to solve real life problems	PSO -2	K3
CO - 4	Analyze the results of linear programming models and identify the optimal solutions.	PSO-1	K4
CO - 5	Reframe the real life problems	PSO -5	K5

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

Semester: V				LINEARPROGRAMMING								Hours: 4
Code : 23MA5DE1B												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	3	3	3	3	3	5	3	3	3.36
CO - 2	2	3	3	3	5	4	2	3	3	5	3	3.36
CO - 3	5	3	3	5	3	3	3	5	3	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

The Linear Programming problem- Formulating a Problem as linear Programming model - General LPP- Surplus Variables - Canonical and Standard Forms of LPP - Terminology for the Solution of LPP - Graphical Solution Method. **(12 Hours)**

UNIT II

The Simplex Algorithm - set of artificial variables - Big-M method - Charnes Two Phase method - Solution of simultaneous linear equations by simplex method. **(12 Hours)**

UNIT III

Duality in linear programming: General primal dual pair - Formulating a dual problem - Duality and simplex method - Summary of primal - dual relationship - Economic interpretation of duality - Dual simplex method. **(12 Hours)**

UNIT IV

Transportation Problem: General structure of a T.P - Existence of solution in T.P - Duality in T.P - Economic interpretation - Degeneracy in T.P - Standard T.P table - Solution of a T.P - methods for finding initial basic feasible solution - Optimality test. **(12 Hours)**

UNIT V

The Assignment problem: Model formulation of an assignment problem - assumptions in assignment problem - method of solving an assignment problem - special cases in assignment problem - typical assignment problem. **(12 Hours)**

COURSE BOOK:

1. Kanti Swarup, P. K. Gupta and S. Manmohan, Introduction to Management Science, Operations Research, Sultan Chand Sons, 20th Revised Edition, 2022.

Unit I	:	Chapter 2 : Sections 2.1 - 2.9 Chapter 3 : Section 3.1
Unit II	:	Chapter 3: Sections 3.4- 3.6
Unit III	:	Chapter 5: Sections 5.1- 5.8
Unit IV	:	Chapter 7: Sections 7.1 - 7.10
Unit V	:	Chapter 8: Sections 8.1 - 8.5

BOOK FOR REFERENCE:

1. P. K. Gupta and S. Manmohan, Linear Programming and Theory of Games, Sultan ChandSons,9th Edition, 2000.

E-RESOURCES:

1. https://nptel.ac.in/courses/112106134
2. https://onlinecourses.swayam2.ac.in/cec23_ma02/preview

ASTRONOMY

Semester: V **Hours: 4**

Code : 23MA5DE1C **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge of celestial bodies	PSO - 1	K1
CO - 2	Understand the concept of natural science	PSO - 4	K2
CO - 3	Sketch the features of objects in the solar system.	PSO - 2	K3
CO - 4	Analyze the occurrence of astronomical events	PSO - 5	K4
CO - 5	Appraise the phases of sun and moon	PSO - 3	K5

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

Semester: V				**ASTRONOMY**								**Hours: 4**
Code : 23MA5DE1C												**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	3	5	3	3	3	4	3.55
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	5	3	3	3	3	3	3	3	3	5	3.36
CO - 5	3	3	5	3	3	3	3	3	5	3	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

Celestial sphere and diurnal motion: Celestial Sphere - Celestial coordinates - Sidereal time. **(12 Hours)**

UNIT II

Morning and evening stars - circumpolar stars - zones of earth - perpetual day - twilight. **(12 Hours)**

UNIT III

Refraction - Laws of refraction - Astronomical refraction - tangent formula - horizontal refraction - geocentric parallax - horizontal parallax. **(12 Hours)**

UNIT IV

Kepler's laws: Kepler's laws - Anomalies -Kepler's equation - Calendar.

(12 Hours)

UNIT V

Moon: Introduction - sidereal and synodic months - elongation - phase of moon - eclipses - umbra and penumbra - lunar and solar eclipses - maximum and minimum number of eclipses in a year. **(12 Hours)**

COURSE BOOK:

1. S. Kumaravelu and Susheela Kumaravelu, Astronomy, SKV Publications, 2002.

Unit I	Chapter: 2	Section: 39 - 69
Unit II	Chapters: 2 & 3	Section: 80 - 83, 87 - 89, 111 - 116
Unit III	Chapters: 4 & 5	Section: 117 - 128, 131- 144
Unit IV	Chapters: 6 &7	Section: 146 - 149, 156 - 159, 175 - 179
Unit V	Chapters: 12 & 13	Section: 229 - 241, 256 - 263, 267, 268, 273, 274

BOOKS FOR REFERENCE:

1. G V Ramachandran, Text Book of Astronomy, Mission Press, Palayamkottai, 1965.
2. Michael Seeds, Foundations of Astronomy, Third Edition, Wadsworth Publishing Company, California, 1992.

E-RESOURCE:

1. https://nptel.ac.in/courses/115107130

FUZZY SETS

Semester: V **Hours: 4**

Code : 23MA5DE2A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Know the evolution from crispness to fuzziness	PSO - 4	K1
CO - 2	Interpret arithmetic operation on fuzzy numbers	PSO - 2	K2
CO - 3	Apply the principles of fuzzy logic to solve real world problems	PSO - 1	K3
CO - 4	Analyze the properties of α-cuts and extension principles of fuzzy sets	PSO - 3	K4
CO - 5	Assess the utilization of fuzzy equations in realistic environment	PSO -5	K5

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

Semester: V				**FUZZY SETS**							**Hours: 4**
Code : 23MA5DE2A											**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	2	3	3	3	5	5	3	3	3	5	3	3.36
CO - 2	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 3	5	4	3	3	3	3	5	3	3	3	4	3.55
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

From classical (crisp) sets to Fuzzy sets - Introduction - Crisp sets: An overview - Fuzzy sets: Basic types - Fuzzy sets: Basic concepts. **(12 Hours)**

UNIT II

Fuzzy sets versus crisp sets - Additional properties of α-cuts - Representations of fuzzy sets - Extension principle for fuzzy sets. **(12 Hours)**

UNIT III

Operations on fuzzy sets: Types of operations - Fuzzy complements - Fuzzy intersections: **(12 Hours)**

UNIT IV

Fuzzy unions: Combinations of operations - Aggregation operations. **(12 Hours)**

UNIT V

Fuzzy Arithmetic: Fuzzy numbers - Linguistic variables - Arithmetic operations on intervals - arithmetic operations on fuzzy numbers - Lattice of fuzzy numbers - Fuzzy equations. **(12 Hours)**

COURSE BOOK :

1. George J. Klir / Bo Yuan, Fuzzy sets and Fuzzy Logic, Theory and Applications, Prentice Hall of India Pvt. Ltd., New Delhi, 2016.

   Unit I: Chapter 1: Sections 1.1 - 1.4

   Unit II : Chapter 2: Sections 2.1 -2.3

   Unit III: Chapter 3: Sections 3.1 - 3.3

   Unit IV: Chapter 3: Sections 3.4 - 3.6

   Unit V: Chapter 4: Sections 4.1 - 4.6

BOOK FOR REFERENCE:

1. A.K. Bhargava, Fuzzy Set Theory and Fuzzy Logic and their Applications, S. Chand Company, 2013.

E-RESOURCE:

1. https://onlinecourses.nptel.ac.in/noc24_ee32/preview

NUMERICAL METHODS WITH APPLICATIONS

Semester: V **Hours: 4**

Code : 23MA5DE2B **Credit:3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Grasp the fundamental concepts in numerical methods	PSO - 4	K1
CO - 2	Interpret the numerical techniques in computational Mathematics	PSO - 2	K2
CO - 3	Solve real world problems by applying numerical methods	PSO - 1	K3
CO - 4	Analyze the numerical solution of ordinary differential equations	PSO - 3	K4
CO - 5	Evaluate the practicality of numerical methods	PSO - 5	K5

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

Semester: V				**NUMERICAL METHODS WITH APPLICATIONS**								**Hours: 4**
Code : 23MA5DE2B												**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	2	3	3	3	5	5	3	3	3	5	3	3.36
CO - 2	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 3	5	4	3	3	3	3	5	3	3	3	4	3.55
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	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 - Regular Falsi method - Newton Raphson method. **(12 Hours)**

UNIT II

Simultaneous Equations: Introduction - Simultaneous Equations - Back substitution- Gauss Elimination Method - Gauss Jordan Elimination Method - Interpolation: Newton's Interpolation Formulae - Central Difference Interpolation formula - Lagrange's Interpolation formula - Divided differences - Newton's Divided Difference Formula - Inverse Interpolation. **(12 Hours)**

UNIT III

Numerical Differentiation and Integration: Introduction - Derivatives using Newton's Forward Difference Formula - Derivatives using Newton's Backward Difference formula - Derivatives using central difference formula. **(12 Hours)**

UNIT IV

Numerical Integration - Newton-Cote's Quadrature formula - Trapezoidal rule - Simpson's one-third rule - Simpson's three-eighth rule - Weddle's rule - Romberg's method. **(12 Hours)**

UNIT V

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

(12 Hours)

COURSE BOOK :

1. S. Arumugam, A. Thangapandi Isaac and A. Somasundaram, Numerical Methods, SCITech Publications (India) Pvt. Ltd., Second Edition, 2017.

Unit I :	Chapter 3 : Sections 3.1 - 3.5
Unit II :	Chapter 4 : Sections 4.1 - 4.4
	Chapter 7 : Sections 7.1 - 7.6
Unit III :	Chapter 8 : Sections 8.1 - 8.3
Unit IV :	Chapter 8 : Section 8.5
Unit V :	Chapter10 : Sections 10.1 - 10.4

BOOKS FOR REFERENCE:

1. A.Singaravelu, Numerical Methods, Meenakshi Agency, Chennai, 2004.
2. M. K. Venkataraman, Numerical Methods for Science and Engineering, National Publishing Company, Chennai. (1992)

E - RESOURCE:

1. https://onlinecourses.nptel.ac.in/noc24_ma36/preview

CRYPTOGRAPHY

Semester: V **Hours: 4**

Code : 23MA5DE2C **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge on cryptography	PSO - 1	K1
CO - 2	Compare symmetric and asymmetric encryption	PSO - 4	K2
CO - 3	Apply the basic techniques to protect data	PSO - 2	K3
CO - 4	Analyze the structure and design of Encryption System	PSO - 5	K4
CO - 5	Criticize the algorithms for encryption and decryption.	PSO-3	K5

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

Semester: V				CRYPTOGRAPHY							Hours: 4
Code : 23MA5DE2C											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	3	5	3	3	3	4	3.55
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	5	3	3	3	3	3	3	3	3	5	3.36
CO - 5	3	3	5	3	3	3	3	3	5	3	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 = Total of Values / Total No. of POs & PSOs	Mean Overall Score for COs= Total of Mean Scores / Total No. of COs

UNIT I

Data Encryption Techniques: Introduction - Encryption methods - cryptography - substitution ciphers - transposition ciphers - Cryptanalysis - steganography.

(12 Hours)

UNIT II

Data Encryption Standards - block ciphers - block ciphers modes of operation - feistel ciphers - data encryption standard - triple DES - DES design criteria - other block ciphers - differential cryptanalysis - linear cryptanalysis. **(12 Hours)**

UNIT III

Advanced encryption standard - introduction - advanced encryption standard - overview of rijndael- Encryption - Decryption - advantages of AES - comparison of AES with other Ciphers. **(12 Hours)**

UNIT IV

Symmetric Ciphers - blowfish encryption algorithm - RC5 - RC4 - RC6 - comparison between RC6 and RC5. **(12 Hours)**

UNIT V

Public Key Cryptosystems: Introduction - Public Key cryptography - RSA algorithm. **(12 Hours)**

COURSE BOOK:

1. V. K. Pachghare, Cryptography and Information Security, PHI Learning Private Limited 2010.

   Unit I : Chapter 2: Sections 2.1 - 2.7

   Unit II : Chapter 3: Sections 3.1 -3.11

   Unit III : Chapter 4: Sections 4.1 - 4.3, 4.5 - 4.6 & 4.8 - 4.9.

   Unit IV : Chapter 5: Sections 5.1 - 5.6

   Unit V : Chapter 7: Sections 7.1 - 7.3

BOOKS FOR REFERENCE:

1. William Stallings, Cryptography and Network Security Principles and Practices, Fourth Edition, Prentice Hall, 2006.
2. Bruice Schneier, Applied Cryptography, Second Edition, Wiley India, 2011.

E-RESOURCE:

1. https://archive.nptel.ac.in/courses/106/105/106105031/

INTERNSHIP

Semester: V

Code : 23MA5IN01 **Credit: 2**

COURSE OUTCOMES:

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

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

Semester: V				**INTERNSHIP**							**Credit: 2**
Code : 23MA5IN01											
Course Outcomes	**Programme 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	2	3	3	3	5	5	2	3	3	5	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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UG INTERNSHIP - GUIDELINES

I. Identify placement and objectives.

II. Observe and connect concepts.

III. Apply knowledge to tasks.

IV. Prepare structured report.

V. Present and reflect experience.

JACEP - EXTENSION

U.G. PROGRAMME OUTCOMES (2023 - 2026)

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Acquire comprehensive knowledge and evaluate analytically in their specific disciplines.
2.	Apply the acquired knowledge in professional and social life.
3.	Evolve new methodologies in the specific disciplines leading to innovation and employability.
4.	Develop critical thinking required to pursue research.
5.	Apply the computational and life skills to the challenging problems in life.
6.	Design and develop independent projects.

U.G. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO. NO.	UPON COMPLETION OF THIS PROGRAM THE STUDENTS WILL BE ABLE TO	PO MAPPED
PSO - 1	Understand and identify the needs of the community and articulate viewpoints both practically and theoretically.	PO-1
PSO - 2	Develop among themselves a sense of social and civic responsibility to be more culturally equipped.	PO-2
PSO - 3	Apply their education in finding practical solutions to individual, community problems to exercise their rights properly.	PO- 3
PSO - 4	Acquire leadership qualities and a democratic attitude by carrying out their duties as effective citizens of the country.	PO- 4
PSO - 5	Develop the capacity to think clearly and cogently to meet emergencies and national disasters and practise national integration and social harmony.	PO- 5, PO- 6

JACEP - EXTENSION

Semester: V-VI **Hours: 60**

Code : 23SLPEX01 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Impart knowledge on education.	PSO-1	K1
CO - 2	Analyse the reasons for health problems and impart knowledge on a balanced diet.	PSO-2	K2
CO - 3	Develop a concern for the voiceless and faceless and rectify it.	PSO-3, PSO-4	K3
CO - 4	Get awareness of environmental issues and solve the issues.	PSO-4	K4
CO - 5	Apply different fields of knowledge to the society.	PSO-5	K5

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

Semester: V -VI				JACEP - EXTENSION							Hours: 60
Code : 23SLPEX01											Credit: 1
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)				Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	3	4	3	3	3	5	3	3	3	4	3.54
CO - 2	3	5	3	4	3	4	3	5	3	3	3	3.54
CO - 3	3	4	5	3	3	4	3	3	5	5	3	3.72
CO - 4	3	2	3	3	5	3	3	3	4	5	3	3.36
CO - 5	3	3	2	3	3	5	3	3	3	3	5	3.27
Overall Mean Score												3.48

Result: The Score for this Course is **3.48** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I: LITERACY GROUP:

Giving orientation for the students about JACEP - importance of education awareness of dropouts and counselling the parents to re-admit the school dropouts- organizing activities based on the disciplines - arranging competitions for school children - educating the school children about the positives and negatives of social media- Higher studies after +2.

UNIT II: HEALTH AND HYGIENE GROUP:

Doing a survey on health problems - organizing medical camps and talks - organizing basic medical check-ups, conducting health and hygiene talk by B. Voc students of JAC to the adopted villages- Balance diet, orientation about home nurse- rapport with Government and NGO's

UNIT III: LIAISON GROUP & PEOPLE ORGANIZATION GROUP:

Motivating workers to access government savings schemes with unorganised sectors- celebrating important days - Services offered in E- Sevai centres- organizing income generation skill training for self-help groups. organizing population education programmes - conducting awareness programmes on emerging social issues - rapport with non-governmental organizations and local bodies to ensure the development of the villages - organizing youth, farmers and self-help group to function democratically.

UNIT IV: ENVIRONMENTAL GROUP:

Tree and sapling plantation - promotion of Herbal Gardens - observing environmental-related days - awareness campaign to educate the villagers to protect the environment.

UNIT V: APPLICATION OF KNOWLEDGE:

Conducting Special Skill Training for self-employment based on discipline to the target group with the help of NGO's and government organizations - awareness on social media.

BOOKS FOR REFERENCE:

1. Higher studies after +2
2. Services offered in E-Sevai services
3. பிறப்பு முதல் இறப்பு வரை அரசு ஆவணங்கள்/ சேவைகள் வழிகாட்டு கையேடு
4. அரசு நலத்திட்ட உதவிகள் தகவல் கையேடு
5. வருவாய் மற்றும் பேரிடர் மேலாண்மை துறை மூலம் பொது மக்களுக்கு இ சேவை வழியாக இணையதள மின் சேவை

SCHEME OF EVALUATION

	Continuous Internal Assessment	
1.	Attendance (60 hours)	10 Marks
2.	Field Visit & Report	50 marks
3.	Assignment	40 Marks
	Total	**100 marks**

LINEAR ALGEBRA

Semester: VI **Hours: 5**

Code : 23MA6MC13 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire a comprehension of essential concepts in linear algebra	PSO - 4	K1
CO - 2	Understand the features of matrices and characteristic equation	PSO - 2	K2
CO - 3	Transfer the value of eigen vectors in various fields	PSO - 1	K3
CO - 4	Analyze the orthogonality of vector spaces	PSO - 3	K4
CO - 5	Evaluate the impact of theory of matrices in diverse mathematical and applied field	PSO - 5	K5

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

Semester: VI						**LINEAR ALGEBRA**					**Hours: 5**
Code : 23MA6MC13											**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	5	4	3	3	3	3	5	3	3	3	4	3.55
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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Vector spaces: Introduction - Definition and Examples - Subspaces - Linear transformations - Span of a set. **(15 Hours)**

UNIT II

Linear Independence - Basis and dimension -Rank and nullity - Matrix of a linear transformation. **(15 Hours)**

UNIT III

Inner product spaces: Introduction - Definition and examples - Orthogonality - Orthogonal complement. **(15 Hours)**

UNIT IV

Theory of matrices: Introduction - Algebra of matrices - Types of matrices - The inverse of a matrix - Elementary transformations - Rank of a matrix. **(15 Hours)**

UNIT V

The characteristic equation and Cayley Hamilton theorem - Eigen values & Eigen vectors - Bilinear forms: Introduction - Bilinear forms. **(15 Hours)**

COURSE BOOK :

1. S. Arumugam and A. Thangapandi Isaac, Modern Algebra, Scitech Publications (India) Pvt. Ltd., 2008.

Unit I : Chapter 5: Sections 5.0 - 5.4

Unit II : Chapter 5: Sections 5.5 - 5.8

Unit III : Chapter 6: Sections 6.0 - 6.3

Unit IV : Chapter 7: Sections 7.0 - 7.5

Unit V : Chapter 7: Sections 7.7 & 7.8

Chapter 8: Sections 8.0 - 8.1

BOOK FOR REFERENCE:

1. Georgi E Shilov, Linear Algebra, Dover Publications Pvt. Ltd., 1978.

E-RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc24_ma31/preview
2. https://onlinecourses.nptel.ac.in/noc24_ma13/preview

COMPLEX ANALYSIS

Semester: VI **Hours: 5**

Code : 23MA6MC14 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge on calculus of complex functions	PSO - 1	K1
CO - 2	Understand the concepts of continuity, analyticity and transformations	PSO - 4	K2
CO - 3	Articulate the series sum	PSO - 3	K3
CO - 4	Illustrate the regular and singular points of a function	PSO - 2	K4
CO - 5	Evaluate contour integrals	PSO-5	K5

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

Semester: VI						**COMPLEX ANALYSIS**					**Hours: 5**
Code : 23MA6MC14											**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	3	5	3	3	3	4	3.55
CO - 2	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 3	3	3	5	3	3	3	3	3	5	3	3	3.36
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

UNIT I

Limits, Continuity and Analytic Functions: Limits - Uniqueness of limit - Continuity - Properties - Derivatives - Differentiation formula - Analytic Functions - singular points. **(15 Hours)**

UNIT II

Conformal Mapping and Transformations: Definition - Critical point of the transformation - Transformations - Bilinear transformation - Elementary transformations. **(15 Hours)**

UNIT III

Definite integrals: Properties of definite integrals - Contours - Line Integrals - Cauchy's integral theorem - Cauchy Goursat theorem - Extension of Cauchy's integral theorem - Cauchy's integral formula - Derivatives of analytic functions - Morera's theorem - Liouville's theorem - Fundamental theorem of algebra - Maximum Modulus theorem. **(15 Hours)**

UNIT IV

Power Series: ABEL's theorem - Cauchy's General principle of convergence for a series - Absolute convergence of a series - Uniform convergence - Elementary functions - Taylor's series - Laurent's series - Zeros of an analytic function - Singularities - Riemann's theorem - Weriestrass's theorem.

(15 Hours)

UNIT V

Residues and Poles: Residues - Calculation of Residues - Residue at infinity - Cauchy's Residue theorem - Contour integration around circular and semicircular contours where the function has no real roots - Type I, Type II - Cauchy's lemma - Type III - Jordon Lemma. **(15 Hours)**

COURSE BOOK:

1. T. K. Manicavachagom Pillay, Dr. S.P. Rajagopalan and Dr. R. Sattanathan, Complex Analysis, S. Viswanathan (Printers & Publishers), Pvt. Ltd., 2013.

Unit I	:	Chapter 2: Pg. No. 21 - 55
Unit II	:	Chapter 3: Pg. No. 57 - 94
Unit III	:	Chapter 4: Pg. No. 95 -138
Unit IV	:	Chapter 5: Pg. No. 139 -172
Unit V	:	Chapter 6: Pg. No. 173 - 240

BOOKS FOR REFERENCE:

1. S. Arumugam, A. ThangapandiIssac and A. Somasundaram, Complex Analysis, Scitech Publications (India), Pvt. Ltd., 2017.
2. James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, Seventh Edition, Mc-Graw Hill Book Co., International Edition, 2009.

E-RESOURCES:

1. https://archive.nptel.ac.in/courses/111/106/111106141/
2. https://archive.nptel.ac.in/courses/111/107/111107056/

MATHEMATICAL MODELLING

Semester: VI **Hours: 5**

Code : 23MA6MC15 **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 mathematical models	PSO - 1 PSO - 3	K1
CO - 2	Summarize the models through linear difference equation	PSO - 4	K2
CO - 3	Apply mathematical modelling to solve differential and difference equations.	PSO - 2	K3
CO - 4	Analyze the need of mathematical modelling through differential and difference equations.	PSO - 1	K4
CO - 5	Reframe real life problems	PSO-5	K5

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

Semester: VI				**MATHEMATICAL MODELLING**							**Hours: 5**
Code : 23MA6MC15											**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	5	3	3	3	5	3	5	3	3	3.72
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	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												**3.47**

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

Note:

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

Values Scaling:

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

UNIT I

Mathematical Modelling: Simple situations requiring mathematical modelling - The technique of mathematical modelling - Classification of mathematical models - Some characteristics of mathematical models. **(15 Hours)**

UNIT II

Mathematical Modelling through ordinary differential equations: Mathematical modelling through differential equations - Linear growth and decay models - Non-Linear growth and decay models - Compartment models. **(15 Hours)**

UNIT III

Mathematical Modelling through system of Ordinary differential equations of first order: Prey-predator models - Competition models - Simple Epidemic model - Susceptible - infected- susceptible (SIS) model, SIS model with constant number of carriers - Model with removal and model with immigrations. Medicine: Model for Diabetes Mellitus. **(15 Hours)**

UNIT IV

The Need for Mathematical Modelling through Difference equations - Basic theory of linear difference equations with constant coefficients - Solution of a system of linear homogeneous difference equations with constant coefficients - Solution of linear difference equations by using Laplace transforms - Solution of linear difference equations by using Z - transforms - Solution of nonlinear difference equations reducible to linear equations - Stability theory for difference equations.

(15 Hours)

UNIT V

Mathematical Modelling through difference equations in Economics and Finance- The Harrod model, Cobweb model - Samuelson's interaction model - Application to Actuarial Science**.** **(15 Hours)**

COURSE BOOK:

1. J. N Kapur, Mathematical Modeling, New Age International Publishers, 2009.

   Unit I : Chapter1 : Sections 1.1-1.4

   Unit II : Chapter2 : Sections 2.1- 2.4

   Unit III : Chapter3 : Sections 3.1.1, 3.1.2, 3.2.1 - 3.2.6 & 3.5.1

   Unit IV : Chapter 5 : Sections 5.1& 5.2

   Unit V : Chapter 5 : Section 5.3

BOOKS FOR REFERENCE:

1. BimalK. Mishra and Dipak K. Satpathi, Mathematical Modeling, Ane Books Pvt. Ltd., 2009.
2. Sandip Banerjee, Mathematical Modeling Models, Analysis and Applications, RC Press, Taylor & Francis Group, 2014.

E-RESOURCE:

1. https://onlinecourses.nptel.ac.in/noc22_ma20/preview

OPERATIONS RESEARCH

Semester: VI **Hours: 5**

Code : 23MA6MC16 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire the knowledge on decision-making, queuing and inventory	PSO - 1	K1
CO - 2	Understand the concept of optimization techniques	PSO - 4	K2
CO - 3	Apply appropriate optimization techniques to solve the problems	PSO - 3	K3
CO - 4	Analyze the strategies to solve the problems	PSO-2	K4
CO - 5	Reframe real life problems into mathematical models	PSO-5	K5

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

Semester: VI				**OPERATIONS RESEARCH**							**Hours: 5**
Code : 23MA6MC16											**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	3	5	3	3	3	5	3.55
CO - 2	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 3	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 4	3	3	3	5	3	3	3	2	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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Theory of games: Introduction - Two - Person Zero - Sum games - The Maximin Minimax principle - Games without saddle points - Mixed strategies - Graphical solution of 2 × N and M × 2 games - Dominance property - Reducing the game problem to a L.P.P.- Minimax and saddle point theorems(without proof).

(15 Hours)

UNIT II

Queuing Theory: Introduction - Queuing system - Characteristics of queuing systems - Symbols and notations - Poisson process and exponential distribution - Classification of queues - Definition of transient and steady states - Poisson queues **(15 Hours)**

UNIT III

The M/M/1 Queuing system: Model I (M/M/1): (/FIFO) - Model II (M/M/1): (/SIRO) - Model III (M/M/1): (N/FIFO) - Sequencing: Introduction - Sequencing Problem - Problems with n-jobs and Two-Machines - Optimal sequence algorithm - Problems with n-jobs and three – machines - Problems with n-jobs and m-machines - Graphic solution -Replacement Problem: Introduction - Replacement of items that deteriorate with time - Replacement of items that fail completely. **(15 Hours)**

UNIT IV

Inventory Management: Introduction - Inventory control - Techniques of inventory control with selective control - Techniques of inventory control with known demand - Economic lot Size problems -problem of EOQ with shortage - Multi-item deterministic problem - techniques of inventory control with uncertain demand. **(15 Hours)**

UNIT V

Network Scheduling by PERT/CPM: Introduction - Basic concepts - Constraints in Networks - Construction of the Network- Time calculations in Networks - Critical Path Method - PERT - PERT Calculations - Resource levelling by network technique. **(15 Hours)**

COURSE BOOK:

1. Kanti Swarup, P. K. Gupta and Man Mohan, Operations Research, Sultan Chand Sons Publishers, Second Greatly Improved Enlarged Edition, 1984.

Unit I	:	Chapter 8	:	Sections 8.1 - 8.8
Unit II	:	Chapter 15	:	Sections 15.1 - 15.8.1.3
Unit III	:	Chapter 16	:	Sections 16.1 - 16.6,
		Chapter 18		Sections 18.1 - 18.3
Unit IV	:	Chapter 17	:	Sections 17.1 - 17.8
Unit V	:	Chapter 20	:	Sections 20.1 - 20.9

BOOKS FOR REFERENCE:

1. Kanti Swarup, P. K. Gupta and Man Mohan, Operations Research, 20th Edition, Sultan Chand & Sons Publishers, 2022.
2. P. K. Gupta and D. S. Hira, Operations Research, S Chand & Company Limited, 2021.

E-RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc19_ma29/preview
2. https://onlinecourses.swayam2.ac.in/cec20_ma10/preview
3. https://onlinecourses.nptel.ac.in/noc22_mg30/preview

PROJECT

Semester: VI **Hours: 4**

Code : 23MA6PR01 **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 - 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 : 23MA6PR01											**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	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	2	3	3	3	5	5	2	3	3	5	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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UG PROJECT - GUIDELINES

I. Choose and define a topic.

II. Review related literature.

III. Apply methods and analyze.

IV. Write and structure report.

V. Present and defend findings.

BOOLEAN ALGEBRA

Semester: VI **Hours: 3**

Code : 23MA6DE3A **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define Posets and Lattices	PSO - 1	K1
CO - 2	Understand the fundamental concepts and operations in Boolean algebra	PSO - 4	K2
CO - 3	Summarize the algebraic structures	PSO - 5	K2
CO - 4	Apply the basic ideas to prove results	PSO - 3	K3
CO - 5	Relate classical Algebra and Boolean algebra	PSO - 2	K4

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

Semester: VI				**BOOLEAN ALGEBRA**							**Hours: 3**
Code : 23MA6DE3A											**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	3	3	3	5	3	3	3	4	3.55
CO - 2	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 3	3	5	3	3	3	3	3	3	3	3	5	3.36
CO - 4	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 5	3	3	3	5	3	3	3	5	3	3	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

Posets and Lattices: Diagrammatical Representation of a Poset - Isomorphisms- Duality - Product of two posets - Lattices: Semi-lattices - Complete Lattices sub lattices. **(9 Hours)**

UNIT II

Modular and Distributive Lattices: Direct products - Ideal lattice - Isomorphism theorem. **(9 Hours)**

UNIT III

Modular and Distributive Lattices: Distributive lattices - Direct products. **(9 Hours)**

UNIT IV

Boolean Algebras - Representation of a finite Boolean algebra -Ideals in a Boolean algebra - Boolean rings. **(9 Hours)**

UNIT V

Boolean Algebras - Boolean functions - Conjunctive Normal Form. **(9 Hours)**

COURSE BOOK:

1. Vijay K. Khanna, Lattices and Boolean Algebras, Vikas Publishing House Pvt. Ltd., New Delhi, 2009.

Unit I	:	Chapter 2: Pg. No. 11 - 37
Unit II	:	Chapter 4: Pg. No. 70 - 82
Unit III	:	Chapter 4: Pg. No. 82 - 95
Unit IV	:	Chapter 5: Pg. No. 96 - 111
Unit V	:	Chapter 5: Pg. No. 111 - 125

BOOKS FOR REFERENCE:

1. Elliott Mendelson, Theory and Problems of Boolean Algebra and Switching Circuits, First Edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1967.
2. Gupta M. K, Discrete Mathematics, First Edition, Krishna Prakasam Media Pvt. Ltd., Meerut, 2003.
3. Venkatraman M. K, Sridharan N and Chandrasekaran N, Discrete Mathematics, National Publishing Company, Chennai, 2011.

E-RESOURCES:

1. https://unacademy.com/content/jee/study-material/mathematics/boolean-algebra/
2. https://unacademy.com/content/nta-ugc/study-material/computer-science/boolean-algebra-boolean-expression-rules-and-theorems/

INDUSTRIAL MATHEMATICS

Semester: VI **Hours: 3**

Code : 23MA6DE3B **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 of modelling and numerical techniques.	PSO - 3	K1
CO - 2	Classify the mathematical techniques in industries	PSO- 5	K2
CO - 3	Apply transforms to solve real life problems	PSO - 2	K3
CO - 4	Correlate mathematical techniques and industrial problems	PSO -1	K4
CO - 5	Reframe real life problems	PSO- 4	K5

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

Semester: VI				**INDUSTRIAL MATHEMATICS**							**Hours: 3**
Code : 23MA6DE3B											**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	3	5	3	3	3	3	3	3	3	3	5	3.36
CO - 3	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 4	5	4	3	3	3	3	5	3	3	3	4	3.55
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

Introduction to Inverse problems: What is an Inverse problem- Elements of an inverse problem - example of measurement Operator - IP and Modelling: Application to MRI - Inverse problems, smoothing and ill - posedness.

(9 Hours)

UNIT II

Integral Geometry - The Radon transform- Transmission tomography - two dimensional X- ray transform - three dimensional Radon transform - Attenuated Radon transform - Single Photon emission computed tomography - Riemann Hilbert problem - Inversion of the attenuated Radon transform. **(9 Hours)**

UNIT III

X-ray: Introduction, X-ray behavior and Beer's Law (The fundamental question of image construction) - Lines in the plane. **(9 Hours)**

UNIT IV

The Radon Transform: Definition - examples - Some properties of Radon Transform. **(9 Hours)**

UNIT V

Phantoms - Designing phantoms - Back Projection: Definition and properties- examples. **(9 Hours)**

COURSE BOOKS:

1. Guillaume Bal, Introduction to Inverse Problems, University of Chicago, Chicago, 2019.
2. Timothy G. Feeman, The Mathematics of Medical Imaging, A Beginners Guide, Springer Under graduate Text in Mathematics and Technology, Springer, 2010.

Unit I: Chapter 1 : Sections 1.1-1.4 (Book 1)

Unit II: Chapter 2 : Sections 2.1-2.2 (Book 1)

Unit III : Chapter 1: Sections 1.1-1.4 (Book 2)

Unit IV: Chapter 2: Sections 2.1- 2.3, 2.4, 2.5 (Book 2)

Unit V: Chapter 3: Sections 3.1-3.3 (Book2)

BOOKS FOR REFERENCE:

1. C.W.Groetsch, Inverse Problems, Activities for Undergraduates, The Mathematical Association of America,1999.
2. Andreas Kirsch, An Introduction to the Mathematical Theory of Inverse Problems, 2nd Edition, Springer, 2011.

E - RESOURCES:

1. https://nptel.ac.in/courses/112106309
2. https://www.udemy.com/course/intro-to-medical-imaging/

AUTOMATA THEORY AND FORMAL LANGUAGES

Semester: VI **Hours: 3**

Code : 23MA6DE3C **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Grasp the basics of languages and grammars	PSO - 4	K1
CO - 2	Understand the roles of deterministic and non-deterministic acceptors	PSO - 3	K2
CO - 3	Apply the concepts of regular and context-free languages in problem solving scenario	PSO - 1 PSO - 2	K3
CO - 4	Analyze the structure and properties of languages	PSO - 1	K4
CO - 5	Evaluate the strength and weakness of Automata	PSO - 5	K5

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

Semester: VI			**AUTOMATA THEORY AND FORMAL LANGUAGES**						**Hours: 3**			
Code : 23MA6DE3C									**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	2	3	3	3	5	5	2	3	3	5	3	3.36
CO - 2	3	3	5	3	3	3	3	3	5	3	3	3.36
CO - 3	5	4	3	5	3	3	5	5	3	3	4	3.90
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												**3.50**

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

Finite automata - deterministic finite accepters and non-deterministic finite accepters. **(9 Hours)**

UNIT II

Regular Languages and Regular grammars - regular expressions - connection between regular expressions and regular languages - regular grammars. **(9 Hours)**

UNIT III

Properties of Regular Languages - closure properties of regular languages, elementary questions about regular languages, identifying non regular languages - a Pumping lemma. **(9 Hours)**

UNIT IV

Context-free Languages - context-free grammars - simplification of context free grammars. normal form - methods for transforming grammars. **(9 Hours)**

UNIT V

Two important normal forms - Chomsky normal form - Greibach normal form.

(9 Hours)

COURSE BOOK:

1. Peter Linz, An introduction to Formal Languages and Automata, Narosa Publications, Third Edition, 2001.

   Unit I : Chapter 2: Sections 2.1 - 2.2

   Unit II: Chapter 3: Sections 3.1 - 3.3

   Unit III: Chapter 4: Sections 4.1 - 4.3

   Unit IV: Chapter 5

   Chapter 6: Section 6.1

   Unit V: Chapter 6: Sections 6.2 - 6.3

BOOK FOR REFERENCE:

1. C. K. Nagpal, Formal Languages and Automata Theory, Oxford Publishers, 2012.

E-RESOURCES:

1. https://www.udemy.com/course/formal-languages-and-automata-theory-e/
2. https://archive.nptel.ac.in/courses/106/103/106103070/

MATHEMATICAL TOOLS

Semester: VI **Hours: 3**

Code : 23SE6MA04 **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 mathematical tools	PSO-3	K1
CO - 2	Understand the notion of functions in GeoGebra and advanced excel	PSO-4	K2
CO - 3	Sketch 3D graphs	PSO-2	K3
CO - 4	Analyze functions and charts	PSO-1	K4
CO - 5	Create charts for visual representation	PSO-2 PSO - 5	K5

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

Semester: VI				**MATHEMATICAL TOOLS**							**Hours: 3**
Code : 23SE6MA04											**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	3	3	3	5	3	3	3	5	3	3	3	3.36
CO - 4	5	4	3	3	3	3	5	3	3	3	4	3.54
CO - 5	3	5	3	5	3	3	3	5	3	3	5	3.72
Overall Mean Score												**3.47**

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

Note:

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

Values Scaling:

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

UNIT I

Introduction to GeoGebra - Basic user interfaces - Basic tools and functionalities (points, lines, polygons, etc.) - Graphics view - Constructing simple geometric figures and shapes. **(9 Hours)**

UNIT II

Geometry and Constructions: Understanding geometric constructions - Exploring properties of shapes (triangles, circles, quadrilaterals) - Investigating angles, parallel lines, perpendicular lines - Transformations (translations, rotations, reflections) and their visualization. **(9 Hours)**

UNIT III

Algebra and Functions - 3D Graphing functions and equations - Exploring algebraic expressions and equations using GeoGebra-Analyzing functions (linear, quadratic, exponential, etc.) - Introducing sliders and dynamic parameters to explore function behaviors. **(9 Hours)**

UNIT IV

Advanced constructions (conic sections, locus constructions) - Calculus concepts visualization (tangent lines, derivatives, integrals) - Probability and statistics with GeoGebra. **(9 Hours)**

UNIT V

Advanced Functions: Nested IF statements, SUMIFS, COUNTIFS, etc. -Data Validation and Protection: Custom data validation rules Protecting sheets, workbooks, and cells with advanced settings-PivotTables and Pivot Charts: Creating complex PivotTables to summarize and analyze data Creating Pivot Charts and customizing them for visual representation. **(9 Hours)**

COURSE BOOK:

- Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. Steve Phelps, An Introduction to GeoGebra, University of Cincinnati (Material).
2. Stephen Moffet, Excel 2010 Advanced, The Mouse Training Company & Ventus Publishing ApS, 2011.

E- RESOURCES:

1. https://onlinecourses.swayam2.ac.in/aic20_sp03/preview
2. https://www.coursera.org/projects/using-advanced-formulas-and-functions-in-excel
3. https://www.udemy.com/course/advanced-excel-course-for-job-and-real-world/

FINANCIAL MATHEMATICS

Semester: VI

Code : 23MA6SS01 **Credit: 2***

COURSE OUTCOMES:

- Acquire the knowledge of annuities and life insurance policies.
- Compute the yield rate of bonds.
- Familiar with capital budgeting and depreciation.
- Apply statistical tools to calculate contingent payments
- Use mathematical methods to solve financial problems

UNIT I

Simple annuities - Definition and notations - Accumulated value of an Ordinary Simple Annuity - Discounted Value of an Ordinary Simple Annuity Other simple Annuities - Finding the term of an Annuity - Finding the interest rate.

UNIT II

Bonds - Introduction to Terminology - Purchase price to yield a given investment rate - Callable bonds - Premium and Discount - Price of a bond between Bond interest dates - Finding the yield rate .

UNIT III

Capital budgeting and depreciation - Net present Value - Internal rate of Return - Capitalized cost and Capital Budgeting - Depreciation.

UNIT IV

Contingent payments - Introduction - Probability - Mathematical Expectation - Contingent payments with time value.

UNIT V

Life annuities and Life insurance - Introduction - Mortality Tables - Pure endowments - Life annuities - Life insurance - Annual premium policies.

COURSE BOOK :

1. Peter Zima and Robert L. Brown, Mathematics of Finance, TataMcgraw - Hill Second Edition, 1999.

Unit I : Chapter 5 : Sections 5.1 - 5.6
Unit II : Chapter 8 : Sections 8.1 - 8.6
Unit III : Chapter 9 : Sections 9.1 - 9.4
Unit IV : Chapter 10: Sections 10.1 - 10.4
Unit V : Chapter 11: Sections 11.1 - 11.6

BOOK FOR REFERENCE:

1. The Mathematics of Financial Models: Solving Real-World Problems with Quantitative Methods, Kannoo Ravindran, Wiley Finance, 2014.

E- RESOURCES:

1. http://www.freetechbooks.com

APPLICABLE MATHEMATICS

Semester: VI

Code : 23MA6SS02 **Credit: 2***

COURSE OUTCOMES:

- Write an argument using logical notation and determine whether the given condition is valid or not.
- Solve mathematical problems using analytical methods.
- Recognize the relationships between different area of mathematics.
- Use mathematical concepts and techniques in practical problems.
- Find the correct ratio in which two or more ingredients in some mixture.

UNIT I

Mathematical Logic.

UNIT II

Pipes and Cisterms.

UNIT III

Boats and Streams.

UNIT IV

Alligation and mixture.

UNIT V

Volume.

COURSE BOOK:

- Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. R. Gopal and V. Subramanyam, Arithmetic and Quantitative Aptitude for Competitive Examinations, Sura College of Competition, 2018.
2. R. S. Aggarwal and S. Chand, Quantitative Aptitude and Company Ltd., New Delhi, 2009.
3. R. S. Aggarwal and S. Chand, A Modern Approach to Verbal & Non - Verbal Reasoning, S. Chand and Company Ltd. New Delhi, 2008.

E-RESOURCE:

1. https://www.indiabix.com/

APPLIED MATHEMATICS

Semester: VI

Code : 23MA6SS03 **Credit: 2***

COURSE OUTCOMES:

- Acquire the knowledge of theory of attributes, space curves and solids
- Understand the association of attributes and generation of solids
- Apply the statistical tools for real life problems
- Analyze various types of index numbers and 3-dimentional structures
- Use statistical tools and geometrical models to solve problems

UNIT I

Attributes - Consistency of data - Independence and Association of data.

UNIT II

Index numbers: Simple index numbers - Weighted index numbers - Consumer price index numbers - Conversion of Chain base index number into fixed base index and conversely.

UNIT III

Space curves-Tangent at a given point - Tangent at any point of the helix - Curvature: Principal Normal - The unit vectors $\vec{t}$ and $\vec{n}$ are mutually perpendicular and define the osculating plane at P-Equation of the osculating plane at P- Binormal**:** Torsion Frenet's formulae.

UNIT IV

Cone -Right circular cone - Intersection of a straight line and a quadric cone- Tangent plane and normal - condition for the plane$lx + my + nz = 0$ to touch the quadric cone $ax^2 + by^2 + cz^2 + 2fyz + 2gzx + 2hxy = 0$- The angle between the line in which the plane $ux + vy + wz = 0$ cuts the cone- condition that the cone has three mutually perpendicular generators.

UNIT V

Cylinder - The equation of the cylinder whose generators are parallel to the line and whose guiding curve is $f(x, y, z) = 0, ax + by + cz + d = 0$ - The equation of the right circular cylinder with axis $\frac{x-\alpha}{l} = \frac{y-\beta}{m} = \frac{z-\gamma}{n}$and radius of the guiding circle - enveloping cylinder.

COURSE BOOKS:

1. Dr. Arumugam and Dr.A. Thangapandi Issac, Statistics, New Gamma Publishing House, Palayamkottai, 2015.
2. S. Narayanan & T. K. Manickavasagom Pillay, Vector Algebra and Analysis, S. Viswanathan (Printers & Publishers), Pvt. Ltd.,1980.
3. T. K. Manickavasagom Pillay and T. Natarajan, A Course Book of Analytical Geometry, Part II - Three Dimensions, S. Viswanathan Printers & Publishers Pvt. Ltd., 2011.

Unit I : Chapter 8: Sections 8.1 -8.3 (Book 1)

Unit II : Chapter 9: Sections 9.1 - 9.3 (Book 1)

Unit III : Chapter 5: (Book 2)

Unit IV : Chapter 5: Sections 2 - 7(Book 3)

Unit V : Chapter 5: Section 8 (Book 3)

BOOKS FOR REFERENCE:

1. D. N. Elhance, Veena Elhance and B. M. Aggarwal, Fundamentals of Statistics, Seventh Edition, Sultan Chand & Sons, 2009.
2. P R VITTAL, Analytical Geometry 2D and 3D , Pearson India, first Edition, 2013.
3. Shanti Narayan and P. K. Mittal, Integral Calculus, S. Chand, 2009.

E-RESOURCES:

1. https://study.com/academy/topic/analytic-geometry-in-3-dimensions.html
2. https://nptel.ac.in/courses/110107114

FUZZY GRAPHS

Semester: VI

Code : 23MA6SS04 **Credit: 2***

COURSE OUTCOMES:

- Know the evolution of crispness and fuzziness in graphs
- Interpret the ideas of graphs in fuzzification
- Apply fuzzy graphs to solve real life problems
- Analyze different types of fuzzy graphs
- Criticize the concept of fuzziness by reframing the real life problems

UNIT I

Fundamentals of Fuzzy Graphs: Definitions of fuzzy graphs - Paths, Cycles and Connectedness - types of arcs and paths-degrees, order and size of fuzzy graphs - automorphism and isomorphism of fuzzy graphs - complement of fuzzy graphs - regular and irregular fuzzy graphs.

UNIT II

Balanced Fuzzy Graphs - cliques in fuzzy graphs - Independent sets in fuzzy graphs- domination in fuzzy graphs - Eigenvalues and energy of fuzzy graphs.

UNIT III

Fuzzy Planar Graphs: concept of crossing between edges - intersecting value in fuzzy multi-graph - effective edges and considerable edges - fuzzy faces in fuzzy graphs - fuzzy dual graph - Isomorphism on fuzzy planar graphs.

UNIT IV

Fuzzy cut vertices and Fuzzy Trees: some basic definitions - fuzzy cut vertex and fuzzy bridge - multimin and locami F-cycles - fuzzy trees

UNIT V

Few Applications of Fuzzy Graphs: application of fuzzy graph in Ecology: competition graph -energy of the food web - application of fuzzy graph in social network: construction of fuzzy social network - centrality of a social unit in fuzzy social network.

COURSE BOOK :

1. Madhumangal Pal, SovanSamanta and Ganesh Ghorai, Modern Trends in Fuzzy Graph Theory, Spinger Nature Singapore Ltd., 2020.

    Unit I: Chapter 1: Sections 1.1 – 1.8

    Unit II: Chapter 1: Sections 1.11 – 1.15

    Unit III: Chapter 2: Sections 2.1 – 2.5

    Unit IV: Chapter 3: Sections 3.1 – 3.4

    Unit V: Chapter 10: Sections 10.1 – 10.2

BOOK FOR REFERENCE:

1. Sunil Mathew & M. S. Sunitha, Fuzzy Graphs: Basics, Concepts and Applications, Lambert Academic Publishers, 2012.

E-RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc20_ge09/preview
2. https://onlinecourses.nptel.ac.in/noc21_cs48/preview

QUESTION PATTERN

SELF STUDY

PART A

(Two questions from each unit) $10 \times 2 = 20$

PART B

(Atleast one question from each unit) $5 \times 7 = 35$

(Five out of Eight)

PART C

(Atleast one question from each unit) $3 \times 15 = 45$

(Three out of Five)

PROBLEM SOLVING SKILLS

Hours: 2

Code: 23MA1SD01 **Credit: 2**

COURSE OUTCOMES:

- Identify the numbers and know their basic properties
- Enhance the reasoning ability
- Analyse logical concepts in Mathematics
- Apply the logic concepts to identify the logic equivalence
- Evaluate and interpret data

UNIT I

Number system - Number series - Number ranking and time sequence test.

(12 Hours)

UNIT II

Mathematical operations - Analytical reasoning - Arithmetical reasoning.

(12 Hours)

UNIT III

Mathematical logic - logical statement - types of propositions - propositional connectives truth tables - the negation of a proposition - disjunction - conjunction - tautology. **(12 Hours)**

UNIT IV

Logical equivalence - the algebra of propositions - conditional propositions – The negation of conditional proposition. **(12 Hours)**

UNIT V

Data analysis and data interpretation - logic sequence of words - Venn diagrams.

(12 Hours)

COURSE BOOK:

- Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. R. V. Praveen, Quantitative Aptitude and Reasoning, PHI Learning Pvt. Ltd., 2013.
2. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, Tata McGraw-Hill Publishing Company Ltd., 3rd Edition 2002.
3. R. S. Aggarwal, Quantitative Aptitude, S. Chand & Company Pvt. Ltd., 2013.

E-RESOURCES:

1. https://youtu.be/h70hwtWcsBM
2. https://youtu.be/dLJp6DrPArk
3. https://youtu.be/Ho93UpJeLrM

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**