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. ADVANCED ZOOLOGY AND BIOTECHNOLOGY

(2024 - 2027)

B.Sc. ADVANCED ZOOLOGY AND BIOTECHNOLOGY

U. G. PROGRAMME OUTCOMES

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

U.G. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Develop an understanding in faunal diversity, distribution, their adaptation and acquire knowledge on the key concepts of multiple biological disciplines.	PO1
2.	Investigate the intricate biological processes, and equip to thrive in diverse fields of biological sciences.	PO3
3.	Gain proficiency in handling Laboratory equipment and perform experimental procedures with the application of scientific reasoning, critical thinking and data analysis to solve biological complexities.	PO4
4.	Imbibe knowledge and skills to mitigate the economic potential of biological science to become successful entrepreneurs and fetch employment opportunities	PO2
5.	Formulate ideas to address scientific challenges in health care and agricultural sectors and communicate them in renowned platforms.	PO5, PO6

U.G. COURSE PATTERN - (2024 - 2027) (UGC/ TANSCHE/ MTU)

Sem.	Part	Code	Title of the Course	Hours	Credit
I	I	24GT1GS01/ 24GH1GS01	Tamil-I/ Hindi-I	6	3
	II	24GE1GS01	English - I	4	3
	III	24ZB1MC01	Invertebrata - I	5	4
		24ZB1MC02	Invertebrata - II	4	3
		24ZB1CP01	Invertebrata and Chordata - Lab	2	-
		24CH1AC1A/ 24CH1AC1B	Allied Chemistry - I General Concepts in Chemistry -I	3	3
		24CH1AP1A/ 24CH1AP1B	Allied Practical: Volumetric Estimation Allied Practical: Semimicro Inorganic Qualitative Analysis	2	1
	IV	24AE1PE01	**AEC -1** Professional English #	2	2
	IV	24ZB1FC01	**Foundation Course:** Fundamentals of Zoology #	2	2
	V	24STPNS01/ 24STPPE01/ 24STPCC01/ 24STPRR01/ 24STPRC01	**Students Training Programme:** National Service Scheme/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	-
			Total	**30**	**21**
II	I	24GT2GS02/ 24GH2GS02	Tamil-II/ Hindi-II	6	3
	II	24GE2GS02	English - II	4	3
	III	24ZB2MC03	Chordata - I	4	4
		24ZB2MC04	Chordata - II	5	5
		24ZB2CP01	Invertebrata and Chordata - Lab	2	2
		24CH2AC2A/ 24CH2AC2B	Allied Chemistry - II General Concepts in Chemistry -II	3	3
		24CH2AP2A/ 24CH2AP2B	Allied Practical - Organic analysis Allied Practical: Quantitative estimation	2	1
	IV	24AE2VE02	**AEC - 2** Sustainability Life Skills #	2	2
		24SE2CE02	**SEC - 1** Soft Skills #	2	2
	V	24STPNS01/ 24STPPE01/ 24STPCC01/ 24STPRR01/ 24STPRC01	**Students Training Programme:** National Service Scheme/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	-
			Total	**30**	**25**

Sem.	Part	Code	Title of the Course	Hours	Credit
III	I	24GT3GS03/ 24GH3GS03	Tamil-III/ Hindi-III	6	3
	II	24GE3GS03	English - III	4	3
	III	24ZB3MC05	Cell and Molecular Biology	4	4
		24ZB3MC06	Genetics	4	4
		24ZB3CP02	Cell and Molecular Biology and Genetics - Lab	2	1
		24BO3AC3A/ 24BO3AC3B	General Botany - I Ethnobotany and Medicinal Botany	3	3
		24BO3AP3A/ 24BO3AP3B	General Botany- I - Lab Ethnobotany and Medicinal Botany - Lab	2	1
	IV	24SE3ZB03	**SEC - 2:** Fermented foods and beverages #	1	1
		24XX3GE01	**GE -1** (Arts to Arts and Science to Science) #	2	2
		24AE3ES03	**AEC - 3:** Environmental Studies #	2	2
	V	24STPNS01/ 24STPPE01/ 24STPCC01/ 24STPRR01/ 24STPRC01	**Students Training Programme:** National Service Scheme/ Physical Education/ Consumer Club/ Red Ribbon Club/ Youth Red Cross	-	-
			Total	**30**	**24**
IV	I	24GT4GS04/ 24GH4GS04	Tamil-IV/ Hindi-IV	6	3
	II	24GE4GS04	English - IV	4	3
	III	24ZB4MC07	Animal Physiology	6	6
		24ZB4CP03	Animal Physiology - Lab	3	2
		24BO4AC4A/ 24BO4AC4B	General Botany - II Applied Botany	3	3
		24BO4AP4A/ 24BO4AP4B	General Botany - II - Lab Applied Botany - Lab	2	1
	IV	24SE4OA4C	**SEC - 3:** Office Fundamentals #	3	2
		24XX4GE02	**GE - 2:** (Arts to Science and Science to Arts) #	2	2
		24AE4CB04	**AEC - 4:** Capacity Building #	1	1
	V	24STPNS01/ 24STPPE01/ 24STPCC01/ 24STPRR01/ 24STPRC01	**Students Training Programme:** National Service Scheme/ 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	24ZB5MC08	Biochemistry	5	4
		24ZB5MC09	Microbiology	6	5
		24ZB5MC10	Immunology	6	5
		24ZB5CP04	Biochemistry, Microbiology and Immunology Lab	5	2
		24ZB5DE1A/ 24ZB5DE1B/ 24ZB5DE1C	**Discipline Specific Elective - 1** Biostatistics and Research Methodology Human Reproductive Biology Aquatic Zoology	4	3
	III	24ZB5DE2A/ 24ZB5DE2B/ 24ZB5DE2C	**Discipline Specific Elective - 2** Clinical Lab Technology Livestock Management and Animal Husbandry Wild Life Conservation and Management	4	3
	IV	24ZB5IN01/ 24ZB5IT01	Internship/ Industrial Training (Carried out in II-year Summer Vacation) (30 hours)	-	2
	V	24SLPEX01	**Service-Learning Programme:** Extension JACEP	-	-
			Total	**30**	**24**
VI	III	24ZB6MC11	Developmental Biology	5	4
		24ZB6MC12	Genetic Engineering and rDNA Technology	5	4
		24ZB6MC13	Ecology and Evolution	6	5
		24ZB6CP05	Developmental Biology, rDNA Technology, Ecology and Evolution- Lab	4	2
		24ZB6PR01	Project*	4	3
		24ZB6DE3A/ 24ZB6DE3B/ 24ZB6DE3C	**Discipline Specific Elective - 3** Bioinformatics Entomology and Pest Management Introduction to Forensic Science	3	2
	IV	24SE6ZB01	**Skill Enhancement Compulsory Course (SEC) - 4 (Domain specific skill courses) -** Cell Culture Techniques #	3	2
	V	24ZB6SS01/ 24ZB6SS02/ 24ZB6SS03/ 24ZB6SS04/ 24ZB6SM01	**Self-Study Course:** Bionomics Dietetics Bioinstrumentation IPR, Biosafety and Bioethics MOOCs	-	2*
		24SLPEX01	**Service-Learning Programme:** Extension (JACEP)	-	1
			Total	**30**	**23+2***
			Total	**180**	**140+3***

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

*** Group Project**

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

FOR I B.Sc. ADVANCED ZOOLOGY AND BIOTECHNOLOGY STUDENTS

COURSE PATTERN

Sem.	Part	Code	Title of the Paper	Hours	Credit
I	III	24CH1AC1A/ 24CH1AC1B	Allied Chemistry-I / General Concepts in Chemistry-I	3	3
	III	24CH1AP1A/ 24CH1AP1B	Allied Practical: Volumetric Estimation/ Allied Practical: Semimicro Inorganic Qualitative Analysis	2	1
II	III	24CH2AC2A/ 24CH2AC2B	Allied Chemistry-II/ General Concepts in Chemistry-II	3	3
	III	24CH2AP2A/ 24CH2AP2B	Allied Practical: Organic analysis/ Allied Practical: Quantitative estimation	2	1

CERTIFICATE COURSE ON GANDHIAN THOUGHT

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

CONTINUOUS INTERNAL ASSESSMENT COMPONENT (CIA) - 2024-2027 -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

PROJECT WORK (UG)

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 (UG)

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

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 PATTERN - UG (2024-2027)

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

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

INTERNAL QUESTION PATTERN (Fully Internal Papers) - UG (2024-2027)

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	24. a)
			Or
			24. 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 5Credits

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

பொதுத்தமிழ் - 1
(பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: ஒன்று **நேரம்: 6**

குறியீடு: 24GT1GS01 **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 : 24GT1GS01											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	5	2	3	3	3	5	3	2	3	3	3.18
CO - 2	4	3	3	5	3	3	3	3	3	4	5	3.55
CO - 3	3	4	3	3	5	5	4	5	3	3	3	3.73
CO- 4	3	4	5	3	3	3	4	3	5	3	3	3.55
CO - 5	5	3	3	3	3	3	3	3	3	5	3	3.36
Overall Mean Score												**3.47**

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

Note:

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

Values Scaling:

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

அலகு 1: மரபுக் கவிதை

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

அலகு 2: புதுக்கவிதை

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

அலகு 3: சிறுகதைகள்

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

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

அலகு 5: மொழித்திறன் போட்டித் தேர்வு

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

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

பாட நூல்கள்

1. தமிழ்த்துறை வெளியீடு (தொகுப்பு) - பொதுத்தமிழ் - 1
ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி (தன்னாட்சி), பெரியகுளம்.

2. முனைவர் சி. பாலசுப்பிரமணியன் - தமிழ் இலக்கிய வாலாறு,
பாவை பப்ளிகேஷன்ஸ், சென்னை - 60
இரண்டாம் பதிப்பு - 2016.

பார்வை நூல்கள்:

1. பெ. சுந்தரனார் - மனோன்மணீயம்
நியூ செஞ்சுரி புக் ஹவுஸ்
சென்னை.

2. முடியரசன் - முடியரசன் கவிதைகள்,
பாரிநிலையம்,
சென்னை.

3. பாரதிதாசன் - பாரதிதாசன் கவிதைகள்,
மணிவாசகர் பதிப்பகம்,
சென்னை

4. கவிமணி - ஆசிய ஜோதி
பாவை பப்ளிகேஷன்ஸ்
சென்னை.

5. கண்ணதாசன் கவிதைகள் - ஆட்டனத்தி ஆதிமந்தி
வானதி பதிப்பகம்,
சென்னை.

6. வைரமுத்து - வைரமுத்து கவிதைகள்
திருமகள் நிலையம்,
சென்னை.

7. மு. மேத்தா - மு. மேத்தா கவிதைகள்,
கவிதா வெளியீடு,
சென்னை.

8. கவிஞர் சிற்பி - சிற்பியின் கவிதை வானம்,
மணிவாசகர் பதிப்பகம்,
சென்னை.

9. நா. முத்துக்குமார் - ஆனந்த யாழை மீட்டுகிறாய்
இணையவழி தகவல் திரட்டு

10. சுகிர்தாராணி - சபிக்கப்பட்ட முத்தம்
இணையவழி தகவல் திரட்டு

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

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

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

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

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

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

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

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

PART I - HINDI - COURSE PATTERN (2024 - 2027)

Part	Sem.	Code	Title of the Paper	Hours/ Week	Credit
I	I	24GH1GS01	Paper - I - Prose, Short Story and Grammar - I	6	3
	II	24GH2GS02	Novel, One act Play, and Grammar - II	6	3
	III	24GH3GS03	Poetry and History of Hindi Literature, Technical Hindi	6	3
	IV	24GH4GS04	General Essay, Translation and Letter Writing, Alankar	6	3
		Total		**24**	**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: 6**

Code : 24GH1GS01 **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 : 24GE1GS01 **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 : 24GE1GS01											**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
    d. 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

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 points 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 **12 Hours**

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.
3. Hema K. *Current English Usage.* Shanlax Publications, 2016.

WEB SOURCES

https://www.youtube.com/watch?v=Y94s85-Crew

https://www.esolcourses.com/content/topicsmenu/listening.html

INVERTEBRATA - I

Semester: I **Hours: 5**
Code : 24ZB1MC01 **Credit: 4**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the characteristics and classifications of major Invertebrate phyla.	PSO -1	K1
CO - 2	Memorize the key morphological and anatomical structures and physiological process of Invertebrates.	PSO - 2	K2
CO - 3	Apply the knowledge of Invertebrate to understand their physiological adaptations, ecological roles and biological diversity.	PSO - 4	K3
CO - 4	Compare and contrast the life cycles and reproductive strategies of different Invertebrate taxa.	PSO - 3	K4
CO - 5	Evaluate the exceptional attributes of different classes of Invertebrates.	PSO - 5	K5

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

Semester: I				**INVERTEBRATA - I**								**Hours: 5**
Code : 24ZB1MC01												**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	3	4	3	3	5	3	4	3	3	3.55
CO - 2	4	3	5	3	4	4	4	5	3	3	4	3.82
CO - 3	4	5	4	3	4	4	4	4	3	5	4	4.00
CO - 4	4	3	3	5	3	3	4	3	5	3	3	3.55
CO - 5	3	4	3	3	5	5	3	3	3	4	5	3.73
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: CLASSIFICATION AND PROTISTA

Concept and general characters of five kingdom of life. Animal kingdom - Systems of classification and nomenclature, Levels of organization. General characters of Protista and classification up to class with an example. Type study - Paramecium. General topics - Protozoan diseases, Life Cycle of Plasmodium, Nutrition in Protozoa, Locomotion in Protozoa. **(15 Hours)**

UNIT II: PORIFERA

Characters and classification up to class with an example, Type study - Leucosolenia, Scypha. General topics - Canal system in sponges, Skeleton in sponges. **(15 Hours)**

UNIT III: COELENTERATA AND CTENOPHORA

Characters and classification up to class with an example. Type study - Obelia Colony. General topics - Polymorphism in Coelenterate, Types of corals, Coral reefs, Structure of coral polyp. Characters and affinities of Ctenophora. **(15 Hours)**

UNIT IV: PLATYHELMINTHES AND ASCHELMINTHES

Platyhelminthes - Characters and classification up to class with an example. Type study - Liver fluke. General topics - Platyhelminth parasites of man - *Taenia solium*, *Taenia saginata*, *Hymenolepis nana*, *Diphyllobothrium latum*, *Schistosoma haematodium*. Aschelminthes - Characters and classification up to class with an example. Type study - *Ascaris*. General topics - Nematode parasite of man - *Ascaris lumbricoides, Wuchereria bancrofti*, *Dracunculus medinensis*, *Ancylostoma duodenale*, *Enterobius vermicularis*, *Tricocephalus trichuris.* Parasitic adaptations of helminth parasites. **(15 Hours)**

UNIT V: ANNELIDA

Characters and classification up to class with an example. Type study - Earth worm. General topics - Coelom and coelomoducts, Metamerism in Annelida, Filter feeding in Polychaetes. **(15 Hours)**

COURSE BOOK:

1. Ekambaranatha Ayyar and Ananthakrishnan, T.N. Manual of Zoology Volume, Part I (2019) (INVERTEBRATA). S. Viswanathan Pvt. Ltd. Chennai.

   Unit I: Chapter 7, 8, 9.

   Unit II: Chapter 10.

   Unit III: Chapter 11, 12, 13, 14, 15.

   Unit IV: Chapter 16, 22.

   Unit V: Chapter 27

BOOKS FOR REFERENCE:

1. Barnes, R.D. Invertebrate Zoology (2006) VII Edition. Holt Saunders International Edition.
2. Kotpal, R.L. (2020). Modern text book of Zoology Invertebrates, 12th Edition, Rastogi Publications, Meerut.
3. Jordan and Verma (2022). Invertebrate Zoology S. Chand & Co, New Delhi.
4. Anderson D. T. (2001). Invertebrate Zoology, 2nd Edition, Oxford University Press, New Delhi.
5. Barrington, E.J.W. (2012). Invertebrate Structure and Function. English Language Book Society.
6. Hyman, L.H. (1967). The Invertebrates (6 volume). McGraw-Hill Companies Inc. New York.

E - Resources

- https://www.uou.ac.in/sites/default/files/slm/MSCZO-501.pdf
- http://rcastilho.pt/DA/ewExternalFiles/Invertebrates_Cap_33_Cambell.pdf
- https://research.nhm.org/disco/arip2016/Day%2001%20Presentations/4.%20AnimalDiversity.pdf
- https://public.wsu.edu/~rlee/biol103/animal1.pdf

INVERTEBRATA - II

Semester: I **Hours: 4**
Code : 24ZB1MC02 **Credit: 3**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the characteristics and classifications of major phyla in Invertebrates	PSO - 1	K1
CO - 2	Memorize the key morphological and anatomical structures and physiological process of Invertebrates.	PSO - 2	K2
CO - 3	Apply the knowledge of Invertebrate to understand their physiological adaptations, ecological roles and biological diversity.	PSO - 4	K3
CO - 4	Compare and contrast the life cycles and reproductive strategies of different Invertebrate taxa.	PSO - 3	K4
CO - 5	Evaluate the exceptional attributes of different classes of Invertebrates.	PSO -5	K5

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

Semester: I				**INVERTEBRATA - II**							**Hours: 4**
Code : 24ZB1MC02											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	3	4	3	3	5	3	4	3	3	3.55
CO - 2	4	3	5	3	4	4	4	5	3	3	4	3.82
CO - 3	4	5	4	3	4	4	4	4	3	5	4	4.00
CO - 4	4	3	3	5	3	3	4	3	5	3	3	3.55
CO - 5	3	4	3	3	5	5	3	3	3	4	5	3.73
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

Arthropoda I: Characters and classification up to class with examples. Brief descriptions of *Limulus* and Sacculina, Type study - *Penaeus* (External morphology, Appendages, Respiratory system, Excretory system, Reproductive system and Life history. **(12 Hours)**

UNIT II

Arthropoda II: General topics: Crustacean larvae. Mouth parts of Insects, Metamorphosis of insects, Beneficial Insects, Social life in insects, Salient features of Arachnids, Affinities of Peripatus. **(12 Hours)**

UNIT III

Mollusca: Characters and classification up to class with an example. Type study - Pila (External morphology, Pallial complex, Digestive system, Respiratory system, Nervous system and Reproductive system). General topics - Cephalopod as an advanced Mollusca,Economic importance of Mollusca. **(12 Hours)**

UNIT IV

Echinodermata: Characters and classification (up to class) of Echinodermata with an example. Type study - Starfish. (External morphology, Pedicellaria, Digestive system, Sense organs and Reproductive system) General topics: Echinoderm larva and Water vascular system. **(12 Hours)**

UNIT V

Minor Phyla: Acoelomate Phyla - General characters and affinities (Mesozoa and Nemertinea), Pseudocoelomate Phyla - Definition and affinities (Endoprocta, Acanthocephala, Rotifera, Gastrotricha, Kinorhyncha, Nematomorpha), Coelomate Phyla - General characters and affinities (Ectoprocta, Brachiopoda, Phoronida, Chaetognatha, Priapulida, Sipunculida, Echiuroida and Pogonophora). **(12 Hours)**

COURSE BOOK:

1. Ekambaranatha Ayyar and Ananthakrishnan, T.N. Manual of Zoology Volume, Part II (2019) (INVERTEBRATA). S. Viswanathan Pvt. Ltd. Chennai.

   Unit I: Chapter 31.

   Unit II: Chapter 40.

   Unit III: Chapter 44, 48

   Unit IV: Chapter 53, 57.

   Unit V:

   https://www.zoologytalks.com/ectoprocta-structure-life-history-affinities/

   https://www.studocu.com/in/document/sant-gadge-baba-amravati-university/zoology/minor-phyla-lecture-notes-1-3/21725384

BOOKS FOR REFERENCE:

1. Barnes, R.D. Invertebrate Zoology (2006) VII Edition. Holt Saunders International Edition.
2. Kotpal, R.L. (2020). Modern text book of Zoology Invertebrates, 12th Edition, Rastogi Publications, Meerut.
3. Jordan and Verma (2022). Invertebrate Zoology S. Chand & Co, New Delhi.
4. Anderson D. T. (2001). Invertebrate Zoology, 2nd Edition, Oxford University Press, New Delhi.
5. Barrington, E.J.W. (2012). Invertebrate Structure and Function. English Language Book Society.
6. Hyman, L.H. (1967). The Invertebrates (6 vols). McGraw-Hill Companies Inc. New York.

E - Resources

- https://www.uou.ac.in/sites/default/files/slm/MSCZO-501.pdf
- http://rcastilho.pt/DA/ewExternalFiles/Invertebrates_Cap_33_Cambell.pdf
- https://research.nhm.org/disco/arip2016/Day%2001%20Presentations/4.%20AnimalDiversity.pdf
- https://public.wsu.edu/~rlee/biol103/animal1.pdf

INVERTEBRATA AND CHORDATA - LAB

Semester: I **Hours: 2**

Code : 24ZB1CP01

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the diverse range of Invertebrate and Chordate organisms.	PSO - 1	K1
CO - 2	Explain the structural and functional diversity of Invertebrates and chordates.	PSO - 2	K2
CO - 3	Demonstrate a comprehensive understanding of the anatomical features of Invertebrate and chordate organisms	PSO -4	K3
CO - 4	Differentiate the Invertebrate and chordates by analyzing their external and internal morphology	PSO -3	K4
CO - 5	Evaluate the adaptive features and economic importance of representatives of Invertebrates and chordates	PSO -5	K5

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

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

Semester: I							**INVERTEBRATA AND CHORDATA - LAB**					**Hours: 2**
Code : 24ZB1CP01												
Course Outcomes	**Programme 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	4	4	5	4	3	3	4	3.82
CO - 2	4	3	5	3	3	3	4	5	3	3	3	3.55
CO - 3	4	5	4	3	3	3	4	4	3	5	3	3.73
CO - 4	4	3	4	5	3	3	4	4	5	3	3	3.73
CO - 5	3	4	4	3	5	5	3	4	3	4	5	3.91
Overall Mean Score												**3.75**

Result: The Score for this Course is **3.75** (High Relationship)

Note:

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

Values Scaling:

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

EXTERNAL CHARACTERS:

Earthworm, Cockroach

DISSECTION:

Cockroach - Digestive system

- Nervous system

MOUNTING:

Body setae of Earthworm

Mouth Parts of Honey Bee

Mouth Parts of Cockroach

Mouth Parts of Mosquito

Sting of Honey Bee

SPOTTERS:

Amoeba, Paramecium, Euglena, Clathrina, Sycon, Obelia, Aurelia, Physalia, Liver fluke, Tapeworm, Planaria, Ascaris (Male and Female), Nereis, Peripatus, Limulus, Millipede, Centipede, Prawn, Nauplius larva, Zoea larva, Sepia, Octopus, Chiton, Sea urchin, Sea Cucumber, Starfish.

SURVEY OF CAMPUS INSECTS - Collection and submission of insects.

ALLIED CHEMISTRY - I

Semester: I **Hours: 3**
Code : 24CH1AC1A **Credit: 3**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Acquire knowledge on the basic concepts of periodic table of elements, atomic structure, chemical bonding, biomolecules, empirical and molecular formula and sources of polymers	PSO-1	K1
CO-2	Describe the periodic properties of elements, different models of atom, classification of carbohydrates, deducing molecular formula and classification of polymers	PSO-2	K2
CO-3	Illustrate the periodic variations of elements, atomic structure, chemical bonding, classification of amino acids, Zwitter ion empirical and molecular formula and preparation of polymers	PSO-3	K3
CO-4	Analyse the periodic properties of elements, orbits, orbitals, MO diagram, proteins, aminoacids, empirical and molecular formula and properties of polymers	PSO-4	K4
CO-5	Evaluate the properties of periodic table elements, types of overlapping of orbitals, structure of carbohydrates, molecular formula and applications of polymers	PSO-5	K5

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

Semester: I				ALLIED CHEMISTRY - I								Hours: 3
Code : 24CH1AC1A												Credit: 3
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	3	4	4	4	3	5	4	3	3	4	3.81
CO - 2	3	3	5	5	3	3	3	5	3	3	3	3.55
CO - 3	3	5	3	3	3	3	3	3	5	3	3	3.36
CO - 4	3	3	3	3	3	5	3	3	3	5	3	3.36
CO - 5	3	3	3	3	5	4	3	3	3	4	5	3.55
Overall Mean Score												**3.53**

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

Note:

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

Values Scaling:

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

UNIT I: PERIODIC TABLE:

Modern periodic table - groups and periods - classification of elements on the basis of electronic configuration - properties of elements - atomic radii - ionic radii - size of atoms and ions - ionization energy - electronegativity - electron affinity - trends in periodic table **(9 Hours)**

UNIT II

a) STRUCTURE OF ATOM:

Bohr model of an atom - merits and demerits - Sommerfield modification - wave nature - de Broglie's equation - difference between orbit and orbital - shapes of atomic orbitals

b) BONDING:

Valence Bond (VB) theory - s-s, s-p and p-p overlap - application to the formation of simple molecules like hydrogen and oxygen - Molecular Orbital (MO) theory - MO diagram for H_2, O_2 and F_2 - difference between VB theory and MO theory **(9 Hours)**

UNIT III

a) CARBOHYDRATES:

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

b) AMINO ACIDS: Classification - Properties: dipolar structure -Zwitter ion - uses

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

UNIT IV: DEDUCING MOLECULAR FORMULA:

Detection of nitrogen, halogen and sulphur in organic compounds (Lassigne's test) - definition of Empirical Formula (EF), Molecular Formula (MF) and Structural Formula (SF)- calculation of empirical and molecular formula from their percentage composition- difference between EF, MF and SF. **(9 Hours)**

UNIT V: POLYMER CHEMISTRY:

Definition - classification of polymers based on origin, mode of formation, structure and application - rubber - natural rubber - vulcanization - synthetic rubbers - preparation and uses of buna rubbers and neoprene- plastics: Thermoplastics and thermosetting plastics - distinction and uses - resins: Definition - preparation and uses of Bakelite. **(9 Hours)**

COURSE BOOK

1. Mary Imelda Jayaseeli, M. Kalanithi, C. Mary Anbarasi, Sr. T. Johny Dathees and Sr. S. Sahaya Leenus, Allied Chemistry-I, New Century Book House (P)Ltd., Chennai, first edition, 2020

GENERAL CONCEPTS IN CHEMISTRY-I

Semester: I **Hours: 3**
Code : 24CH1AC1B **Credit: 3**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the properties of hydrogen, hydrogen peroxide, oxides, halogen compounds, ozone, ideal and real gases, kinetic reactions, alkaloids and terpenoids	PSO-1	K1
CO - 2	Explain the classification of hydrogen, hydrogen peroxide, oxides, ozone, alkaloids and terpenoids and describe the behaviour of ideal gases and rate of the reactions	PSO-2	K2
CO - 3	Illustrate the structure of hydrogen peroxide and ozone, enzyme catalysed reactions, alkaloids and terpenoids and deviation of real gases	PSO-3	K3
CO - 4	Analyse the strength of hydrogen peroxide, halogen compounds, behaviour of real gases, order and molecularity of reactions, isolation of alkaloids and terpenoids	PSO-4	K4
CO - 5	Evaluate the properties of hydrogen, hydrogen peroxide, oxides, halogen compounds and ozone, ideal and real gases, rate constant of reaction, alkaloids and terpenoids	PSO-5	K5

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

Semester: I				GENERAL CONCEPTS IN CHEMISTRY-I								Hours: 3
Code : 24CH1AC1B												Credit: 3
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	3	3	3	4	3	5	3	3	3	4	3.55
CO - 2	3	3	5	5	3	3	3	5	3	3	3	3.55
CO - 3	4	5	3	3	3	3	4	3	5	3	3	3.55
CO - 4	3	3	3	3	3	5	3	3	3	5	3	3.36
CO - 5	3	3	3	3	5	4	3	3	3	4	5	3.55
Overall Mean Score												3.51

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

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

Values Scaling:

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

UNIT I: HYDROGEN AND HYDROGEN PEROXIDE:

a) Hydrogen: isotopes of hydrogen -separation of the isotopes -properties and uses of heavy hydrogen -position of hydrogen in the periodic table - ortho and para hydrogen - separation - difference in structure and properties - hydrides - definition - classification -preparation and properties.

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

UNIT II: OXIDES, OZONE AND HALOGEN COMPOUNDS:

a) Oxides: Definition -classification - properties.

b) Ozone: manufacture, composition, structure and properties.

c) Halogen compounds: Dichloromethane, chloroform, carbon tetrachloride, DDT and BHC - preparation, properties and uses. **(9 Hours)**

UNIT III: GASEOUS STATE:

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

UNIT IV: CHEMICAL KINETICS:

Rate of reaction - rate law and rate constant - order and molecularity of reactions - derivation of first order rate constant - half -life period - examples of second order, third order reactions - enzyme kinetics. **(9 Hours)**

UNIT V: ALKALOIDS AND TERPENOIDS:

a) **Alkaloids:** Definition -occurrence - extraction of alkaloids and general properties -classification of alkaloids - structures of cocaine, papaverine, piperine and nicotine (structural elucidation not required).

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

COURSE BOOKS:

1. K. Ratinamuthu, R. Victoria, Semester-I, Text book of Ancillary Chemistry, Educational publishers, Madurai.

   Unit I - III

2. A. Mary Imelda Jayaseeli, M. Kalanithi, C. Mary Anbarasi, S. Pooranalakshmi, Allied Chemistry III and IV, Shanlax publications., Madurai, first edition, 2022.

   Unit IV

3. K. Ratinamuthu, R. Victoria, Semester-IV, Text book of Ancillary Chemistry, Educational publishers, Madurai.

   Unit V

ALLIED PRACTICAL: VOLUMETRIC ESTIMATION

Semester: I **Hours: 2**

Code : 24CH1AP1A **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recognize the techniques of titrimetric analyses	PSO - 1	K1
CO - 2	Describe the procedures to do the volumetric titration using double burette method	PSO - 2	K2
CO - 3	Estimate the amount of substance present in the given solution	PSO - 3	K3
CO - 4	Demonstrate the different types of titrations such as acidimetry, alkalimetry and permanganometry	PSO - 4	K4
CO - 5	Develop problem solving and analytical skills	PSO - 5	K5

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

Semester: I				ALLIED PRACTICAL: VOLUMETRIC ESTIMATION							Hours: 2
Code : 24CH1AP1A											Credit: 1
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	3	4	4	3	3	5	4	3	3	3	3.64
CO - 2	4	3	5	5	3	3	4	5	3	3	3	3.73
CO - 3	3	5	3	3	4	4	3	3	5	4	4	3.73
CO - 4	4	3	3	3	4	5	4	3	3	5	4	3.73
CO - 5	3	3	4	4	5	4	3	4	3	4	5	3.82
Overall Mean Score												3.73

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

Note:

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

Values Scaling

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

A double titration involving making up of the solution to be estimated following double burette method

ACIDIMETRY AND ALKALIMETRY:

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

PERMANGANIMETRY:

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

IODOMETRY:

Estimation of potassium dichromate (demonstration only)

REFERENCE:

Practical guide prepared by the Chemistry Department

ALLIED PRACTICAL: SEMIMICRO INORGANIC QUALITATIVE ANALYSIS

Semester: I **Hours: 2**

Code : 24CH1AP1B **Credit: 1**

COURSE OUTCOMES:

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

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

Semester: I				**ALLIED PRACTICAL: SEMIMICRO INORGANIC QUALITATIVE ANALYSIS**							**Hours: 2**
Code : 24CH1AP1B											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	4	3	3	5	4	3	3	3	3.64
CO - 2	4	3	5	5	3	3	4	5	3	3	3	3.73
CO - 3	3	5	3	3	4	4	3	3	5	4	4	3.73
CO - 4	4	3	3	3	4	5	4	3	3	5	4	3.73
CO - 5	3	3	4	4	5	4	3	4	3	4	5	3.82
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

Analysis of a simple salt containing one cation and one anion.

i) ANIONS:

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

ii) CATIONS:

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

COURSE BOOK:

1. V. Venkateswaran, R. Veerasamy and A. R. Kulandaivelu, Basic principles of Practical chemistry, Sultan Chand and sons, 2nd edition, 2012

PROFESSIONAL ENGLISH #

Semester: I **Hours: 2**

Code : 24AE1PE01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Reproduce simple sentences without committing errors in spelling	PSO-1	K1
CO - 2	Associate language skills by using domain-specific registers	PSO-2	K2
CO - 3	Administer unfamiliar texts with comprehensive skill	PSO-3	K3
CO - 4	Appraise lexical, grammatical and socio-linguistic competence in professional contexts	PSO-4	K4
CO - 5	Discriminate vocabulary which are relevant to their profession	PSO-5	K5

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

Semester: I							**PROFESSIONAL ENGLISH #**					**Hours: 2**
Code : 24AE1PE01												**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of COs**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	4	4	4	4	5	3	4	4	4	3.90
CO - 2	3	4	4	4	4	4	4	5	4	4	4	3.81
CO - 3	4	3	3	3	4	4	4	4	5	3	4	3.63
CO - 4	3	4	4	3	4	4	4	3	3	5	4	3.54
CO - 5	3	4	3	3	3	3	3	4	4	4	5	3.45
Overall Mean Score												**3.68**

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

Note:

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

Values Scaling:

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

UNIT I **6 Hours**

Know about Marie Curie (1867-1934)

What is Internet of Things?

UNIT II **6 Hours**

The Indian Scientist who found why the sea is blue.

Tipu Sultan - The Original Rocket Man of India

UNIT III **6 Hours**

History of Saccharin and its side effects.

The Invention of Vaseline

Boolean Algebra - New Words and Concepts

UNIT IV **6 Hours**

Reading Excerpt from 'Hard Times' Written by Charles Dickens

An Angel in Disguise - T.S. Arthur

UNIT V **6 Hours**

APJ Abdul Kalam's speech at IIT Madras 2010

Note Taking and Note Making - Formats for Notes, PowerPoint Preparation and Summary Writing

COURSE BOOK:

- Course materials will be provided by the Department of English.

REFERENCE BOOKS:

English For Physical Sciences (TANSCHE) - 2023

English for Arts and Social Sciences (TANSCHE) -2023

CIA Component	Marks
Test I	40
Test II	40
Quiz	10
Assignment	5
Attendance	5
Total	**100**

INTERNAL QUESTION PATTERN
PROFESSIONAL ENGLISH- 24AE1PE01

Class: I UG **Time: 2 Hours**
Date: **Max. Marks: 40**

Course Outcome	Bloom's K-level	Q. No	SECTION - A 40x1=40 Answer All Questions (From all Units)
CO1-CO5	K1-K5	1-40	New Words and Concepts - One marks Questions

FUNDAMENTALS OF ZOOLOGY

Semester: I **Hours: 2**

Code : 24ZB1FC01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the basic terminologies in the core concepts of Zoology	PSO - 1	K1
CO - 2	Explain the underlying fundamental principles inherent to the diverse branches of Zoology	PSO - 4	K2
CO - 3	Relate the characterstics of living organisms to their biological systems	PSO - 3	K3
CO - 4	Analyze the basic biological processes of cell division, Fertilization, Biomolecules and Immune cells	PSO - 2	K4
CO - 5	Summarize the concepts from different branches of biology to address scientific inquiry	PSO - 5	K5

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

Semester: I				FUNDAMENTALS OF ZOOLOGY #							Hours: 2
Code : 24ZB1FC01											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	4	3	3	3	5	4	3	4	3	3.73
CO - 2	4	5	3	3	4	4	4	3	3	5	4	3.82
CO - 3	4	3	4	5	4	4	4	4	5	3	4	4.00
CO - 4	3	4	5	3	3	3	3	5	3	4	3	3.55
CO - 5	4	3	4	3	5	5	4	4	3	3	5	3.91
Overall Mean Score												3.80

Result: The score for this course is **3.80** (High relationship)

Note:

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

Definition of Life, Characteristics of Living organisms, Difference between plants and animals. Definition - Taxonomy, Animal kingdom, System of classification, Binomial nomenclature Levels of Organization, Outline Classification of Invertebrates and chordates with one example. Branches of Zoology, Scales in Biology - cells, Tissues, organ systems, organisms. Evolution of Life - special creation vs. organic evolution. **(6 Hours)**

UNIT II

Biochemistry: Biomolecules, Properties of water, pH - acids and Bases, Carbohydrates - Biological properties, Definition - isomers, epimers, enantiomers. Protein - Biological properties, Essential and non-essential amino acids. Lipids - Properties, saturated and unsaturated fatty acids, cholesterol, steroids. Definition - Enzymes, Enzyme - Substrate complex, Catalyst, Cofactor, Active site, Difference between protein and Enzymes. Physiology: Definition, Nutrition, Introduction to biological systems (respiratory system, digestive system, nervous system and circulatory system), composition of blood, Blood groups. **(6 Hours)**

UNIT III

Cell Biology: Definition, cells, Prokaryotic vs Eukaryotic cells, Ultra structure of a cell. Cell organelles in brief - Plasma membrane, Endoplasmic reticulum, Mitochondria, Ribosome, Golgi apparatus, Nucleus. Importance of Cell division, Brief note on Cell Cycle, Mitosis and Meiosis. Genetics: Definition, Genes, Alleles, Inheritance, Traits, Recombination, Crossover, Syndromes. Nucleic Acids - Nitrogenous Bases (Purines and Pyrimidines), Nucleotides and Nucleosides.

(6 Hours)

UNIT IV

Developmental Biology: Definition - Sperm and Egg, Gametogenesis, Fertilization, Types of Cleavage -- Holoblastic and Meroblastic, Blastulation, Gastrulation, Ectoderm, Endoderm, Mesoderm. Ecology: Definition, Environment, Ecosystem, Biotic and Abiotic Components, Food chain, Food web, Ecological Pyramid, Populations, communities, Overview of Environmental Pollution. **(6 Hours)**

UNIT V:

Immunology: Immunity, Definition, Types of Immunity - Innate and Acquired, Immune cells - T cells and B cells. Antigen- Antibody, Types of Immune responses - primary and secondary, Immunization. Microbiology: Outline of Five kingdom classification of microorganisms, Ultra structure of a bacteria, Microbial growth curve. **(6 Hours)**

COURSE BOOK

- Course material prepared by the Faculty of PG and Research Centre of Zoology, Jayaraj Annapackiam College for Women (Autonomous), Periyakulam

BOOKS FOR REFERENCE

1. Nair, N.C., Leelavathy, S., Soundara Pandian, N., Murugan, T. & Arumugam, N. (2012). A Textbook of Invertebrates. Saras Publication, Nagercoil.
   Unit I: Chapter I
2. Arumugam N., (2019). Organic Evolution. Saras Publication, Nagercoil
   Unit I: Chapter I
3. Arumugam N, Dulsy Fatima, Narayanan L.M, Meyyan R.P, Nallasingam K. and Prasannakumar S., (2018). Biochemistry. Saras Publication, Nagercoil.
   Unit II: Chapter: 7,8,14, 15, 43, 61
4. Mariakuttiken A. and Arumugam N., (2017). Animal Physiology. Saras Publication, Nagercoil.
   Unit II: Chapter: 1, 15,170
5. Power, C.B. 2009. Cell Biology. Himalayan Publishing House, New Delhi.
   Unit III: Chapter: 1, 10, 16, 17, 18
6. M.A. Subramanian, 2019. Developmental Biology, MJP Publishers, Chennai.
   Unit IV: Chapter 1, 6, 9
7. Mani A., Narayanan L.M., Dulsy Fatima A. M., Selvaraj and Arumugam N. (2013). Immunology and Microbiology. Saras Publications, Nagercoil.
   Unit V: 1,5,13, 89, 102
   https://science.umd.edu/classroom/BSCI363/inouye/assignments/resources/glossary.html
   https://egyankosh.ac.in/bitstream/124456789/42002/1/Unit-2.pdf
   https://coabnau.in/uploads/1619150897_GPB2.2TheoryNote.pdf

PART - V - STUDENT TRAINING PROGRAMME

NATIONAL SERVICE SCHEME

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

Code : 24STPNS01 **Credit: 1***

COURSE OUTCOMES:

- Acquire the basic knowledge about NSS
- Uphold the value system based on the social, political and moral bases
- Understand and identify the needs of the society
- Develop the capacity to meet emergencies and attain knowledge to concentrate on personal health and hygiene
- Face the challenges particularly to become women entrepreneurs

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

Internal Assessment

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

QUESTION PATTERN

NATIONAL SERVICE SCHEME-24STPNS01

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

Date: **Max.: 30 Marks**

SECTION - A

Answer All Questions 2x5=10

Internal choice

SECTION - B

Answer any TWO of the following 2x10=20

PHYSICAL EDUCATION (2023-2026)

Code	Year	Paper Title	Hours	Credit
24STPPE01	I & II	Yoga and Physical Wellness	-	1*

YOGA AND PHYSICAL WELLNESS

Semester: I to IV **Hours: -**

Code : 24STPPE01

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

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

UNIT II: PRANAYAMA

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

UNIT III: SURYANAMASKAR

Meaning - Benefits - Steps - Poses (12 posture)

UNIT IV: NUTRITION

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

UNIT V: FIRST AID

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-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	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: -**

Code : 24STPCC01 **Credit: 1***

COURSE OUTCOMES:

- Acquire the knowledge of aware of the nature, rights and responsibilities of consumer
- Understand the concepts of food trade and certification
- Identify misleading advertisement, consumer court and consumer redressal
- Analyze the concept of food adulteration and ecofriendly products
- Evaluate practical experience through field visit and interact with experts

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

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

Code: 24STPRR01 **Credit: 1***

COURSE OUTCOMES

- Define the meaning and basic concepts of Red Ribbon Club
- Classify the services rendered by Red Ribbon Club
- Relate the vision and objectives of Red Ribbon Club with its services
- Categorize the objectives, Blood identification and HIV Testing process
- Evaluate the awareness programmes against the communicable diseases

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: -**

Code : 24STPRC01 **Credit: 1***

COURSE OUTCOMES:

- Understand themselves in relation to their community
- Identify the needs and problems of the community and involve them in problem solving.
- Gain skills in mobilizing community participation. Develop capacity to meet emergencies and social harmony
- Educate and empower children and youth in the spirit of the Red Cross through constructive trainings and effective leadership
- Provide opportunities for directing and harnessing their energies and idealism into worthwhile humanitarian activities

BASICS OF YOUTH RED CROSS

Semester: I & II **Hours: -**

Code : 24STPRC01 **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,
2. Dr. J. Arul Irudaya Jeyanthi,
3. Dr. B. Amala Jasmine,
4. Mrs. P. Selvarani,
5. Mrs. K. Rani

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: -**

Code : 24STPRC01 **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,
2. Dr. J. Arul Irudaya Jeyanthi,
3. Dr. B. Amala Jasmine,
4. Mrs. P. Selvarani,
5. Mrs. K. Rani

BOOK 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 x1= 5

(Multiple Choice Questions)

Section - B

Answer All Questions 2 x 5=10

(Either or Questions)

Section - C

Answer Any One Question 1x10=10

(One Question Out of Three)

பொதுத்தமிழ் - 2
(பிறதுறை மாணவிகளுக்கு மட்டும்)

பருவம்: இரண்டு **நேரம்: 6**
குறியீடு: 24GT2GS02 **புள்ளி: 3**

COURSE OUTCOMES:

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

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

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

Semester: II			**பொதுத்தமிழ் - 2**						**Hours: 6**			
Code : 24GT2GS02			**(பிற துறை மாணவிகளுக்கு மட்டும்)**						**Credit: 3**			
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	4	2	4	3	3	4	3	2	5	4	3.55
CO - 2	4	4	5	4	4	4	4	4	5	4	4	4.18
CO - 3	3	3	3	5	4	4	3	4	3	3	5	3.64
CO- 4	3	4	3	4	5	5	4	5	3	3	4	3.91
CO - 5	3	5	3	3	2	2	5	2	3	3	3	3.09
Overall Mean Score												**3.68**

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

Note:

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

Values

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

அலகு1

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

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

அலகு2

வள்ளலார்-அருள் விளக்கமாலை (முதல் 10பாடல்கள்)

எச்.ஏ.கிருட்டிணப்பிள்ளை - இரட்சணியமனோகரம் - பால்ய பிராத்தனை

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

அலகு3

தமிழ்விடு தூது - (முதல்20கண்ணி)

திருக்குற்றாலக் குறவஞ்சி-குறத்தி மலைவளம் கூறுதல்

முக்கூடற்பள்ளு-நாட்டுவளம் **18 Hours**

அலகு4

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

அலகு5

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, 5 ஆகியன போட்டித் தேர்வு நோக்கில் நடத்தப்பட வேண்டும்)

பாடநூல்கள்

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

பார்வை நூல்கள்

1. புலவர் பி.ரா.நடராசன் (உ.ஆ) - திருநாவுக்கரசு சுவாமிகள் தேவாரம்,
   உமாபதிப்பகம், சென்னை - 600 001,
   முதல் பதிப்பு - ஏப்ரல் 2003.
2. எம்.நாராயணவேலுப் பிள்ளை (உ.ஆ) - நாலாயிர திவ்யப் பிரபந்தம்,
   முல்லை நிலையம்,சென்னை - 600 017,
   முதல் பதிப்பு - செப்டம்பர்2000.
3. திருவருட்பிரகாசவள்ளலார் - திருவருட்பா,கலைஞன் பதிப்பகம்,
   சென்னை - 600017,
   இரண்டாம் பதிப்பு - 1885.
4. சுந்தரராசன் (உ.ஆ) - இரட்சணியமனோகரம், முல்லை நிலையம்,
   சென்னை-600 017, முதல் பதிப்பு - 2001.

5. கவிக்கோ அப்துல் ரகுமான் - குணங்குடியார் பாடற்கோவை,
நேஷனல் பப்ளிஷர்ஸ்,சென்னை-600 017,
முதல் பதிப்பு - டிசம்பர் 2008.

6. பேரா. சே.இராதாகிருஷ்ணன் - தமிழ்விடு தூது, முல்லை நிலையம்,
சென்னை-600 017.
இரண்டாம் பதிப்பு - 2008.

7. புலியூர்க் கேசிகன் - திருக்குற்றாலக் குறவஞ்சி,
பாவைபப்ளிகேஷன்ஸ், சென்னை-600 014.
இரண்டாம் பதிப்பு - ஜீலை2014.

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

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

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

NOVEL, ONE ACT PLAY AND GRAMMAR

Semester: II **Hours: 6**

Code : 24GH2GS02 **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 **(18 Hours)**

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

UNIT II **(18 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 **(18 Hours)**

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

UNIT IV **(18 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 **(18 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 : 24GE2GS02 **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO -1	State their thoughts by writing in English without grammatical mistakes	PSO-1	K1
CO - 2	Demonstrate the text with comprehension	PSO-2	K2
CO - 3	Utilise website resources	PSO-3	K3
CO - 4	Experiment with independent learning in writing and speaking	PSO-4	K4
CO - 5	Criticise analytical skills in a wide range	PSO-5	K5

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

Semester: II			COMMUNICATIVE ENGLISH - II								Hours: 4
Code : 24GE2GS02											Credit: 3
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of COs
	1	2	3	4	5	6	1	2	3	4	5	
CO -1	3	5	3	3	3	3	3	4	5	3	4	3.54
CO - 2	4	5	4	3	3	4	3	4	4	3	5	3.81
CO - 3	4	4	3	3	5	4	3	4	3	3	5	3.72
CO - 4	3	4	3	4	3	4	3	3	5	3	5	3.63
CO - 5	4	4	3	3	4	4	3	4	5	4	5	3.90
Overall Mean Score												3.72

Result: The score for this course is **3.72** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I **12 Hours**

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

UNIT II **12 Hours**

1. Listening and Speaking
    a. Listening to famous speeches and poems
    b. Making short speeches- Formal: welcome speech and vote of thanks. Informal occasions- Farewell party, graduation speech
2. Reading and Writing
    a. Writing opinion pieces (On travel, food, film /book reviews or 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 usage of prepositions in the context
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.
3. Frederick T. Wood. *Current English Usage: A Concise Dictionary*. Papermac Publisher, 1981

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

CHORDATA - I

Semester: II **Hours: 4**
Code : 24ZB2MC03 **Credit: 4**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the distinct features of different classes of Chordates	PSO - 1	K1
CO - 2	Describe the structural and functional organisation of Chordates	PSO - 2	K2
CO - 3	Infer the affinities, economic importance and parental care strategies of Chordates	PSO - 4	K3
CO - 4	Explain the general characters of different classes of Chordates and features of key specimens	PSO - 3	K4
CO - 5	Evaluate the exceptional attributes of different classes of Chordates.	PSO - 5	K5

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

Semester: II				CHORDATA - I							Hours: 4
Code : 24ZB2MC03											Credit: 4
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)					Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	3	4	3	2	2	5	4	3	3	2	3.27
CO - 2	4	4	5	2	2	2	4	5	2	4	2	3.27
CO - 3	3	5	4	3	2	2	3	4	3	5	2	3.27
CO - 4	4	3	4	5	3	3	4	4	5	3	3	3.73
CO - 5	4	2	4	2	5	5	4	4	2	2	5	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 = $\frac{\text{Total of Values}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score for Cos = $\frac{\text{Total of Mean Scores}}{\text{Total No. of Cos}}$

UNIT I

Prochordata: General characters and classification of Chordata up to class with an example. Urochordata - General characters of Urochordata. Type study - Ascidian. General topics - Affinities of Urochordata, Retrogressive metamorphosis in Ascidia.

(12 Hours)

UNIT II

Prochordata: Cephalochordate - General characters of cephalochordate. Type study - Amphioxus. General topics - Affinities of Amphioxus, Affinities of Prochordata. **(12 Hours)**

UNIT III

Hemichordata: General characters of Hemichordate. Type study - Balanoglossus. General topics - Affinities of Hemichordates, Balanoglossus is an invertebrate. Agnatha - Salient features. Type study - Petromyzon. **(12 Hours)**

UNIT IV

Pisces: General characters of class Pisces, Outline classification of class Pisces up to order with an example. Type study - Scoliodon. General topics - Accessory respiratory organs in fishes, Migration of fishes, Parental care in fishes, Economic importance of fishes, Electric organ in Torpedo. **(12 Hours)**

UNIT V

Amphibia: General characters of class Amphibia. Outline classification of class Amphibia up to order with an example. Type study - Frog. General topics - Parental care in Amphibia. **(12 Hours)**

COURSE BOOK:

1. Ekambaranatha Ayyar and Ananthakrishnan, T.N. Manual of Zoology Volume II, Part I (2019) (CHORDATA). S. Viswanathan Pvt. Ltd. Chennai.

   Unit I: Chapter 2.
   Unit II: Chapter 1.
   Unit III: Chapter 3, 4.
   Unit IV: Chapter 6.
   Unit V: Chapter 7.

BOOKS FOR REFERENCE:

1. Arumugam, N. (2019). Animal Diversity, Volume 2 - Chordata, Saras Publication, Nagercoil.
2. Kotpal R.L. (2019). Modern Text Book of Zoology Vertebrates, 5th edition, Rastogi Publications, Meerut.
3. Young, J.Z. (2004). Life of vertebrates, Clarendon Press, Oxford UK.
4. Pouch Harvey F, Christine M. Janis and John B, Heiser (2002). Vertebrate Life, Pearson Education Inc, New Delhi.
5. Verma P.S. and Jordan, E. L. (2013). Chordate Zoology, S Chand Publishers, New Delhi.

WEB LINKS

1. https://manoa.hawaii.edu/exploringourfluidearth/biological/invertebrates/phylum-chordata
2. https://pressbooks-dev.oer.hawaii.edu/biology/chapter/chordates/
3. https://unacademy.com/content/neet-ug/study-material/biology/phylum-chordata/
4. https://www.cliffsnotes.com/study-guides/biology/biology/animals-invertebrates/chordata

CHORDATA - II

Semester: II **Hours: 5**

Code : 24ZB2MC04 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the distinct features of different classes of chordates.	PSO - 1	K1
CO - 2	Describe the structural and functional organizations of chordates.	PSO - 2	K2
CO - 3	Illustrate the adaptive features of chordates to various habitats.	PSO - 3	K3
CO - 4	Explain the general characters of different chordates and features of key specimens.	PSO - 5	K4
CO - 5	Assess the exceptional attributes of different classes of chordates.	PSO - 4	K5

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

Semester: II				**CHORDATA - II**							**Hours: 5**
Code : 24ZB2MC04											**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	4	3	3	3	5	4	3	2	3	3.36
CO - 2	4	2	5	4	3	3	4	5	4	2	3	3.55
CO - 3	3	2	4	5	2	2	3	4	5	2	2	3.09
CO - 4	4	2	3	3	5	5	4	3	3	2	5	3.55
CO - 5	4	5	3	2	2	2	4	3	2	5	2	3.09
Overall Mean Score												**3.33**

Result: The Score for this Course is **3.33** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Reptilia: General characters of class Reptilia, Outline classification of class Reptilia up to order with an example. Type study - Calotes (External characters, digestive system, respiratory system, circulatory system and urinogenital system). General topics - Identification of poisonous and non - poisonous snakes, poison apparatus, types of poison, Biting mechanism, Salient features of Chelonia, Crocodilus and Sphenodon. **(12 Hours)**

UNIT II

Aves: General characters of class Aves. Outline classification of class Aves up to order with an example. Type study - Pigeon ((External characters, digestive system, respiratory system, circulatory and urinogenital system). **(12 Hours**)

UNIT III

Aves: General topics - Flightless birds, Flight adaptation in birds, Feet and Beak modifications, Migration in birds, Birds are glorified reptiles. **(12 Hours)**

UNIT IV

Mammalia: General characters of class Mammalia. Outline classification of class Mammalia up to order with an example. Type study - Rabbit. (External characters, digestive system, respiratory system, circulatory system and urinogenital system **(12 Hours)**

UNIT V

Mammalia: General topics - Affinities of Prototheria, Adaptation of aquatic mammals, Dentition in Mammals, Adaptive radiation in Metatheria, Stomach in mammals, Migration in mammals. **(12 Hours)**

COURSE BOOK:

1. Ekambaranatha Ayyar and Ananthakrishnan, T.N. Manual of Zoology Volume, Part I (2019) (CHORDATA). S. Viswanathan Pvt. Ltd. Chennai.
   Unit I: Chapter 8.
   Unit II: Chapter 9.
   Unit III: Chapter 8, 9.
   Unit IV: Chapter 10.
   Unit V: Chapter 11

BOOKS FOR REFERENCE:

1. Kotpal R. L. (2019). Modern Text Book of Zoology Vertebrates, 5th edition, Rastogi Publications, Meerut.
2. Young, J. Z. (2004). Life of vertebrates, Clarendon Press, Oxford UK.
3. Pouch Harvey F, Christine M. Janis and John B, Heiser (2002). Vertebrate Life, Pearson Education Inc, New Delhi.
4. Verma P.S. and Jordan, E. L. (2013). Chordate Zoology, S Chand Publishers, New Delhi.

INVERTEBRATA AND CHORDATA - LAB

Semester: II **Hours: 2**
Code : 24ZB2CP01 **Credit: 2**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the diverse range of Invertebrate and Chordate organisms.	PSO - 1	K1
CO - 2	Explain the structural and functional diversity of Invertebrates and chordates.	PSO - 2	K2
CO - 3	Demonstrate a comprehensive understanding of the anatomical features of Invertebrate and chordate organisms	PSO -4	K3
CO - 4	Differentiate the Invertebrate and chordates by analyzing their external and internal morphology	PSO -3	K4
CO - 5	Evaluate the adaptive features and economic importance of representatives of Invertebrates and chordates	PSO -5	K5

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

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

Semester: II					**INVERTEBRATA AND CHORDATA - LAB**							**Hours: 2**
Code : 24ZB2CP01												**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	4	3	4	4	5	4	3	3	4	3.82
CO - 2	4	3	5	3	3	3	4	5	3	3	3	3.55
CO - 3	4	5	4	3	3	3	4	4	3	5	3	3.73
CO - 4	4	3	4	5	3	3	4	4	5	3	3	3.73
CO - 5	3	4	4	3	5	5	3	4	3	4	5	3.91
Overall Mean Score												**3.75**

Result: The Score for this Course is **3.75** (High Relationship)

Note:

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

Values Scaling:

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

EXTERNAL CHARACTERS:

Earthworm, Cockroach

DISSECTION:

Cockroach - Digestive system

- Nervous system

MOUNTING:

Body setae of Earthworm

Mouth Parts of Honey Bee

Mouth Parts of Cockroach

Mouth Parts of Mosquito

Sting of Honey Bee

SPOTTERS:

Amoeba, Paramecium, Euglena, Clathrina, Sycon, Obelia, Aurelia, Physalia, Liver fluke, Tapeworm, Planaria, Ascaris (Male and Female), Nereis, Peripatus, Limulus, Millipede, Centipede, Prawn, Nauplius larva, Zoea larva, Sepia, Octopus, Chiton, Sea urchin, Sea Cucumber, Starfish.

SURVEY OF CAMPUS INSECTS - Collection and submission of insects.

ALLIED CHEMISTRY - II

Semester: II **Hours: 3**
Code : 24CH2AC2A **Credit: 3**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain knowledge about chemistry of chemotherapeutic drugs, catalysis, chromatographic techniques, fertilizers and electrochemistry	PSO-2	K1
CO - 2	Describe the concepts of chemotherapy, surface chemistry, chromatography, fertilizers and corrosion	PSO-1	K2
CO - 3	Apply the preparation methods of drugs, adsorption, catalysis, chromatographic techniques, pesticides and electrochemical reactions	PSO-3	K3
CO - 4	Classify the types of chemotherapeutic drugs, adsorption, chromatographic techniques, fertilizers and electrochemical cells	PSO-4	K4
CO - 5	Evaluate the uses of drugs, catalyst, chromatographic techniques, fertilizers and electrochemistry	PSO-5	K5

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

Semester: II				ALLIED CHEMISTRY - II							Hours: 3
Code : 24CH2AC2A											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	5	3	3	3	5	3	3	3	3.54
CO - 2	5	3	4	4	3	4	5	4	3	4	3	3.81
CO - 3	3	5	4	4	3	4	3	4	5	4	3	3.81
CO - 4	3	4	4	4	3	5	3	4	4	5	3	3.81
CO - 5	4	3	4	4	5	4	4	4	3	4	5	4.00
Overall Mean Score												3.79

Result: The score for this course is **3.79** (High relationship)

Note:

Mapping	1-20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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: CHEMISTRY IN THE SERVICE OF MANKIND:

Antibiotics: definition - classification based on specificity and their gram staining methods-uses of penicillins, chloramphenicol, tetracyclines and streptomycin- **antipyretics:** definition - preparation and uses of aspirin and paracetamol - **analgesics:** definition, types and examples - **antiseptics and disinfectants:** definition, uses and examples-artificial sweeteners: structure and uses of saccharin and aspartame- organic halogen compounds: structure and uses of freon and Teflon **(9 Hours)**

UNIT II

a) SURFACE CHEMISTRY:

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

b) CATALYSIS:

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

UNIT III: CHROMATOGRAPHY:

Definition - classification - applications of chromatography- thin layer chromatography (TLC): principle, choice of adsorbent and solvents, developing of chromatoplates, applications- Column chromatography(CG): Principle, choice of adsorbent and solvents, packing and developing of column, applications- paper chromatography: Principle, choice of adsorbent and solvents, application of sample, development of chromatogram: ascending, descending, radial techniques-R_f value-Applications. **(9 Hours)**

UNIT IV

a) FERTILIZERS:

Definition - nutrients for plants - role of various elements in plant growth - natural and chemical fertilizers - classification of chemical fertilizers - manufacture of urea-mixed fertilizers - organic farming.

b) INSECTICIDES AND PESTICIDES:

Definition- preparation, structure and uses of DDT and BHC **(9 Hours)**

UNIT V: ELECTROCHEMISTRY AND CORROSION:

Electrolytes, electrochemical cells- lead storage cell - pH scale-definition - simple calculation - buffer solution: definition, types, example - corrosion-definition - disadvantages-Types-methods of prevention: galvanizing, tinning, cathodic protection, lacquers- and paints - inhibitors: Anodic and cathodic inhibitors.

(9 Hours)

COURSE BOOK:

1. Mary Imelda Jayaseeli, M. Kalanithi, C. Mary Anbarasi, Sr. T. Johny Dathees and Sr. S. Sahaya Leenus, Allied Chemistry-II, New Century Book House (P) Ltd., Chennai, first edition, 2021

GENERAL CONCEPTS IN CHEMISTRY-II

Semester: II **Hours: 3**
Code : 24CH2AC2B **Credit: 3**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the concept of distribution law, phase rule, photochemistry, coordination chemistry, carbon compounds, dyes and heterocyclic chemistry	PSO-1	K1
CO - 2	Discuss the distribution law, phase rule, photochemistry, coordination compounds, dyes and heterocyclic compounds	PSO-2	K2
CO - 3	Apply the concept of distribution law, phase rule, photochemistry, coordination compounds, carbon based industrial products, dyes and heterocyclic compounds	PSO-3	K3
CO - 4	Analysis the applications of distribution law, phase rule, photochemistry, coordination compounds, carbon based industrial products, polynuclear hydrocarbons, dyes and heterocyclic compounds	PSO-4	K4
CO - 5	Evaluate the significance of distribution coefficient, phase rule, photochemical reactions, coordination compounds, carbon compounds, dyes and heterocyclic compounds	PSO-5	K5

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

Semester: II				**GENERAL CONCEPTS IN CHEMISTRY-II**							**Hours: 3**
Code: 24CH2AC2B											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	4	3	3	5	4	3	3	3	3.63
CO - 2	4	3	5	5	3	4	4	5	3	4	3	3.90
CO - 3	3	5	4	4	3	3	3	4	5	3	3	3.63
CO - 4	3	3	4	4	3	5	3	4	3	5	3	3.63
CO - 5	4	3	4	4	5	3	4	4	3	3	5	3.81
Overall Mean Score												**3.72**

Result: The score for this course is **3.72** (High relationship)
Note:

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

Values Scaling:

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

UNIT I

a) DISTRIBUTION LAW: Statement and mathematical formulation-experimental verification- conditions under which the law is obeyed-derivations from the law(Statement only and no derivation of the respective relations)- applications of distribution law.

b) PHASE RULE: (only qualitative treatment)

LIQUIDS IN LIQUIDS: Distillation of homogeneous binary liquid mixtures- theory of fractional distillation and azeotropic distillation - partially miscible liquids: variation of solubility with temperature - critical solution (consolute) temperature- lower and upper- influence of impurity on C.S.T and applications - Immiscible liquid systems: Theory of steam distillation and its applications. **(9 Hours)**

UNIT II: PHOTOCHEMISTRY:

Definition of photochemical reaction - laws of photochemistry - Grotthus -Draper law -Einstein law - quantum efficiency - consequence of light adsorption by atoms and molecules - Jablonsky diagram - fluorescence - phosphorescence - comparison between thermal and photochemical reactions - photosensitization - chemiluminescence. **(9 Hours)**

UNIT III

a) COORDINATION COMPOUNDS: Definition - nomenclature - definition of various terms involved in coordination chemistry - Werner's theory - EAN rule - VB theory (outline only) - nickel carbonyl - chelates.

b) INDUSTRIAL CARBON: Manufacture of graphite, carbon black, calcium carbide - silicon carbide. **(9 Hours)**

UNIT IV

a) CONDENSED SYSTEM: Naphthalene and anthracene. Isolation from coal tar, synthesis, properties and uses. Structures of the above (No elucidation).

b) DYES: Definition- theory of colour and constitution- classification according to the structure and application- preparation of methyl orange- Bismark brown and malachite green. **(9 Hours)**

UNIT V

a) HETEROCYCLIC COMPOUNDS I: Preparation, properties and structures of pyrrole, furan, thiophene, indole, pyridine, quinoline and isoquinoline (structural elucidation not necessary)

b) HETEROCYCLIC COMPOUNDS II:

Preparation, properties and structures of oxazole, pyrazole and imidazole (structural elucidation not required). **(9 Hours)**

COURSE BOOKS:

1. K. Ratinamuthu, R.Victoria, Semester -II, Text book of Ancillary Chemistry, Educational Publishers, Madurai. **Unit I**
2. A. Mary Imelda Jayaseeli, M. Kalanithi, C. Mary Anbarasi, S. Pooranalakshmi, Allied Chemistry III and IV, Shanlax Publications., Madurai, first edition, 2022. **Unit II**
3. K. Ratinamuthu, R.Victoria, Semester -III, Text book of Ancillary Chemistry, Educational Publishers, Madurai. **Unit III**
4. K. Ratinamuthu, R.Victoria, Semester - II, Text book of Ancillary Chemistry, Educational Publishers, Madurai. **Unit IV**
5. K. Ratinamuthu, R.Victoria, Semester - IV, Text book of Ancillary Chemistry, Educational Publishers, Madurai. **Unit V**

ALLIED PRACTICAL: ORGANIC ANALYSIS

Semester: II **Hours: 2**
Code : 24CH2AP2A **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 about the chemistry of fundamental organic reactions	PSO-1	K1
CO - 2	Find the aromatic/non aromatic and saturated/unsaturated nature of the organic substance, special element nitrogen and functional groups	PSO-2	K2
CO - 3	Apply the procedures for finding special element nitrogen and functional groups	PSO-3	K3
CO - 4	Analyze the functional group of organic substances	PSO-4	K4
CO - 5	Adopt safety measures in handling chemicals	PSO-5	K5

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

Semester: II				**ALLIED PRACTICAL: ORGANIC ANALYSIS**								**Hours: 2**
Code : 24CH2AP2A												**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	4	5	3	4	4	3	3.73
CO - 2	3	3	5	5	3	4	3	5	3	4	3	3.73
CO - 3	3	5	3	3	4	4	3	3	5	4	4	3.73
CO - 4	3	3	3	3	4	5	3	3	3	5	4	3.55
CO - 5	3	3	4	4	5	4	3	4	3	4	5	3.82
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

ANALYSIS OF THE ORGANIC SUBSATANCES CONTAINING THE FOLLOWING FUNCTIONAL GROUPS

Primary amines, Amides, Aldehydes, Ketones, Carbohydrates, Esters, Acids and Phenols (Preparation of solid derivative not required)

Report should contain the following

1. Aliphatic / Aromatic
2. Saturated / unsaturated
3. Presence / absence of special element nitrogen
4. Functional group

REFERENCE:

Practical guide prepared by the Chemistry Department

ALLIED PRACTICAL: QUANTITATIVE ESTIMATION

Semester: II **Hours: 2**

Code : 24CH2AP2B **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Gain analytical skills in volumetric estimation	PSO-1	K1
CO - 2	Explain the methods of EDTA, colorimetric titrations	PSO-2	K2
CO - 3	Apply the procedure for colorimetric estimation of metal ions	PSO-3	K3
CO - 4	Analyse the estimation of metals using EDTA, colorimetric titrations	PSO-4	K4
CO - 5	Adopt safety measures in handling chemicals	PSO-5	K5

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

Semester: II			ALLIED PRACTICAL: QUANTITATIVE ESTIMATION						Hours: 2			
Code : 24CH2AP2B									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	4	5	3	4	4	3	3.73
CO - 2	4	3	5	5	3	4	4	5	3	4	3	3.91
CO - 3	3	5	3	3	4	4	3	3	5	4	4	3.73
CO - 4	3	3	3	3	4	5	3	3	3	5	4	3.55
CO - 5	4	3	3	3	5	4	4	3	3	4	5	3.73
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

EDTA TITRATIONS:

1. Estimation of Magnesium
2. Estimation of Zinc
3. Estimation of Hardness of water

COLORIMETRY:

1. Estimation of Iron
2. Estimation of Copper

REFERENCE BOOK:

1. V. Venkateswaran, R. Veeraswamy and A. R. Kulandaivelu, Basic Principles of Practical Chemistry, Sultan Chand and sons, 2nd edition, 2012

SUSTAINABILITY LIFE SKILLS

Semester: II **Hours: 2**

Code : 24AE2VE02 **Credit: 2**

COURSE OUTCOMES:

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

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

Semester: II			**SUSTAINABILITY LIFE SKILLS #**								**Hours: 2**
Code : 24AE2VE02											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	4	4	4	4	3	4	4	3	4	4	3.88
CO - 2	4	4	3	4	4	3	4	4	4	4	4	3.81
CO - 3	4	3	4	4	4	3	4	4	4	4	4	3.81
CO - 4	4	4	4	4	4	3	4	4	3	4	3	3.72
CO - 5	4	4	3	4	4	3	3	4	4	4	4	3.72
Overall Mean Score												**3.78**

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

Note:

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

Values Scaling:

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

UNIT I **6 Hours**

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

UNIT II **6 Hours**

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

UNIT III **6 Hours**

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

UNIT IV **6 Hours**

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

UNIT V **6 Hours**

Sustainable Development Goals.

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

COURSE TEXT:

- Prepared by the members of Foundation Course.

BOOKS FOR REFERENCE:

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

WEB-SOURCES

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

SOFT SKILLS #

Semester: II **Hours: 2**

Code : 24SE2CE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Relate the importance of soft skills for personal and professional success.	PSO-1	K1
CO - 2	Identify the value of time and management.	PSO-5	K2
CO - 3	Inculcate a positive attitude	PSO-4	K3
CO - 4	Classify the differences between Active and Passive	PSO-2	K4
CO - 5	Evaluate how to get along with people by practising good manners.	PSO-3	K5

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

Semester: II				**SOFT SKILLS #**							**Hours: 2**
Code : 24SE2CE02											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	2	2	5	2	4	5	2	2	2	4	3.09
CO - 2	5	4	4	3	4	5	3	4	4	4	5	4.09
CO - 3	4	2	5	2	2	4	2	2	2	5	4	3.09
CO - 4	4	2	2	2	5	4	2	5	2	2	4	3.09
CO - 5	4	5	3	2	2	4	2	2	5	3	4	3.27
Overall Mean Score												**3.33**

Result: The score for this course is **3.33** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I **6 Hours**

What are soft skills? - Importance of Soft Skills-Practising soft skills

Top sixty soft skills

Self-Discovery-SWOC Analysis

UNIT II **6 Hours**

What is Attitude? - Formation of attitudes - Positive and Negative attitudes - The Power of Positive Attitude

UNIT III **6 Hours**

Value of Time - Sense of Time management- Five steps to successful Time Management- Effective scheduling

UNIT IV **6 Hours**

Listening-Listening and Hearing- Active and Passive Listening Advantages of active listening- Listening tips

UNIT V **6 Hours**

Etiquette Introduction- Benefits of etiquette - Practicing good manners - Mind your mobile manners

COURSE BOOK:

- Alex, K. Soft Skills. S Chand & Co Ltd., Chennai: 2009.

BOOKS FOR REFERENCE:

1. Butterfield, Jeff et.al. *Soft Skills for Everyone*. Cengage India, New Delhi: 2022.
2. Hariharan, S., N. Sundararajan, S.P. Shanmugapriya. *Soft Skills. Gauvrav Books, Chennai: 2020*
3. Sharma, Prashant. Soft Skills: Personality Development for Success. BPB Publications, Bengalaru: 2019.

WEB SOURCES:

https://baou.edu.in/assets/pdf/BBAATR-304.pdf

https://www.sirc-icai.org/images/cabf/Soft Skills & Personality Development.pdf

பொதுத்தமிழ் - 3

(பிற துறை மாணவிகளுக்கு மட்டும்)

பருவம்: மூன்று **நேரம்: 6**

குறியீடு: 24GT3GS03 **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**						**Hours: 6**			
Code : 24GT3GS03			**(பிற துறை மாணவிகளுக்கு மட்டும்)**						**Credit: 3**			
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	4	5	4	4	3	4	4	3	5	3.82
CO - 2	3	3	4	4	5	5	3	5	4	3	4	3.91
CO - 3	3	4	5	4	4	4	4	4	5	3	4	4.00
CO- 4	5	3	3	4	4	4	3	4	3	5	4	3.82
CO - 5	3	5	4	3	3	3	5	3	4	3	3	3.55
Overall Mean Score												**3.82**

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

Note:

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

Values Scaling:

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

அலகு 1: பெருங்காப்பியங்கள்

சிலப்பதிகாரம் - வழக்குரை காதை

மணிமேகலை - ஆதிரை பிச்சையிட்ட காதை

சீவகசிந்தாமணி - பூமகள் இலம்பகம் (பாடல் எண் 2327 - 2336)
"கண்ணாடி யன்ன.... " முதல் "தேம்பெய் கற்பகத்.. வரை

வளையாபதி - கற்பில் மகளிர் (பாடல் எண் - 8, 9, 10, 11)
"பள்ள முதுநீர்ப் ....."
"உண்டியுட் காப்புண் ....."
" எத்துணை யாற்று ...."
"தனிப்பெயற் றண்டுளி ....." **18 Hours**

அலகு 2: சமயக் காப்பியங்கள்

பெரியபுராணம் - பூசலார் நாயனார் புராணம்

கம்பராமாயணம் - மந்தரை சூழ்ச்சிப்படலம் (பாடல் எண் 1399 - 1428)
"ஆண்டை அந்நிலை ....." முதல் "ஏனைநீதி இணையன ...." வரை

வில்லிபாரதம் - மற்போர் சருக்கம்

சீறாப்புராணம் - புலிவசனித்த படலம் **18 Hours**

அலகு 3: புதினம்

வஞ்சிமாநகரம் (வரலாற்றுப் புதினம்) **18 Hours**

அலகு 4

பாடம் தழுவிய இலக்கிய வரலாறு **18 Hours**

அலகு 5

மொழித்திறன்

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

பாடநூல்கள்

தமிழ்த்துறை வெளியீடு (தொகுப்பு) - பொதுத்தமிழ் - 3
ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி
(தன்னாட்சி), பெரியகுளம்.

முனைவர் சி. பாலசுப்பிரமணியன் - தமிழ் இலக்கிய வரலாறு
பாவை பப்ளிகேஷன்ஸ்,
சென்னை - 60.
இரண்டாம் பதிப்பு - 2016.

நா. பார்த்தசாரதி - வஞ்சி மாநகரம் (வரலாற்றுப் புதினம்)
பாவை பப்ளிகேஷன்ஸ், சென்னை - 600 014
முதற்பதிப்பு ஏப்ரல் 2012

பார்வை நூல்கள்

நா.மு. வேங்கட சாமி நாட்டார் (உ.ஆ) - சிலப்பதிகாரம் மூலமும் உரையும், ராமையா பதிப்பகம், சென்னை - 14, 10 ஆம் பதிப்பு 2019.

நா.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, மார்ச் 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: 6**

Code : 24GH3GS03 **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 **(18 Hours)**

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

UNIT II **(18 Hours)**

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

UNIT III **(18 Hours)**

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

UNIT IV **(18 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 **(18 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 : 24GE3GS03 **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 : 24GE3GS03									**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	3	5	2	2	3	3	2	5	2	3	3.0
CO - 2	3	2	2	5	2	2	3	5	2	2	2	2.73
CO - 3	5	3	3	2	2	3	5	2	3	2	3	3.0
CO - 4	3	3	2	3	5	3	3	3	2	5	3	3.18
CO - 5	2	5	2	2	4	5	2	2	2	4	5	3.18
Overall Mean Score												**3.02**

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

Note:

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

Values Scaling:

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

UNIT I: POETRY **12 Hours**

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

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

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

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

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

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

Articles, Determiners and Quantifiers

Linking Words/ Connectives

Compound Words

Direct and Reported Speech

UNIT V: LANGUAGE COMPETENCY

Writing letters and emails

Writing in Social media platforms

[Blogs, X, Instagram, Facebook]

Learning etiquette and Email Etiquette **12 Hours**

COURSE BOOKS:

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

BOOKS FOR REFERENCE

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

WEB SOURCES

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

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

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

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

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

CELL AND MOLECULAR BIOLOGY

Semester: III **Hours: 4**
Code : 24ZB3MC05 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the theories and fundamental principles of Cell and Molecular Biology	PSO-1	K1
CO - 2	Explain the structural organization of various cell organelles	PSO-3	K2
CO - 3	Analyse the functional importance of cellular organelles in maintaining the overall health of the organism	PSO-4	K3
CO - 4	Analyze the role of cellular and molecular mechanisms in biological system	PSO-2	K4
CO - 5	Evaluate the role of cell behavior and gene regulation in maintaining cellular homeostasis	PSO-5	K5

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

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

Semester: III				**CELL AND MOLECULAR BIOLOGY**							**Hours: 4**
Code : 24ZB3MC05											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	3	2	2	5	4	3	3	2	3.27
CO - 2	3	2	4	5	2	2	3	4	5	2	2	3.09
CO - 3	3	5	4	3	2	2	3	4	3	5	2	3.27
CO - 4	2	3	5	3	3	3	2	5	3	3	3	3.18
CO - 5	2	3	4	4	5	5	2	4	4	3	5	3.73
Overall Mean Score												**3.31**

Result: The Score for this Course is **3.31** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Cellular organization: The cell theory, protoplasm theory, scope of cell and molecular biology, ultra-structure of prokaryotic and eukaryotic cells and their differences, plasma membrane models, chemical composition and function, structure and function of cell wall, centriole, cilia, flagella and cytoskeleton.

(12 Hours)

UNIT II

Cell organelles: Structure and function of Endoplasmic Reticulum, Golgi Apparatus, Mitochondria, Ribosomes, Lysosome, Microfilaments and Microtubules.

(12 Hours)

UNIT III

Nucleus and cell division: Structure and function of nuclear membrane, chromatin, nuclear matrix, nucleolus, ultra-structure and types of chromosomes, giant chromosomes. Cell division - cell cycle - cell cycle regulation - phases of mitosis and meiosis. Apoptosis. Cancer - characteristics, types, diagnosis and treatment. **(12 Hours)**

UNIT IV

Nucleic acids and DNA repair: Nature, chemical composition, salient features of DNA and RNA, Watson and Crick's model of DNA, different forms of DNA, structure and types of RNA, Mechanism of DNA replication, DNA repair mechanisms.

(12 Hours)

UNIT V

Gene expression and regulation: Gene concept, Genetic code, Central dogma. Transcription - mechanism, post-transcriptional processing of RNAs in prokaryotes and eukaryotes. Translation - post-translational modifications. Gene regulation in prokaryotes (lac operon), Gene silencing and Genetic imprinting, Transposons.

(12 Hours)

COURSE BOOKS:

1. Jacobs M, Cell and Molecular Biology, Volume I, CBS publishers and Distributors Pvt Ltd. New Delhi, 2016.
2. Rastogi S C Cell and Molecular Biology, New Age International Publishers, 2021.
3. De Robertis, E.D.P. and De Roberti's, Jr E.M.F. Cell and Molecular Biology. VIII Edition. Lippincott Williams and Wilkins, Philadelphia, 2020.

UNIT	BOOKS	CHAPTERS
I	1 2 3	1-4, 6, 9 2-5, 6, 7 1
II	1 2 3	5, 10 7, 14 1, 6, 8, 9, 10, 11
III	1 2 3	10 8, 9, 29 1, 2, 13, 14, 15, 16
IV	1 2 3	10 13, 15, 16 13, 14
V	1 2 3	10, 11, 12 17, 18, 19, 22 19, 20, 21

BOOKS FOR REFERENCE:

1. Ajoy Paul, Text Book of Cell and Molecular Biology. Books and Allied (P) Ltd. Kolkata, 2007.
2. Kapoor, V.C. Practice of Animal Taxonomy 5th edition. Oxford and IBH Publishing Co. Pvt. Ltd New Delhi, 2001.
3. Lodish, H. and Berk, A. Molecular Cell Biology, 8th edition W.H. Freeman and Company Limited Publication, New York, 2016.
4. Gupta, P.K. Cell and Molecular Biology, 4th edition. Rastogi Publication, New Delhi, 2014.
5. Geoffrey M. Cooper and Robert E. Hausman. The cell: A Molecular Approach, 6th edition Sinauer Associates Publication, Massachusetts, USA, 2013.
6. Alberts B., Johnson. A., Lewis, J., Raff, M., Roberts, K. and Watter, P. Molecular Biology of the Cell, 5th edition. Garland Science Publication, New York, 2008.

GENETICS

Semester: III **Hours: 4**

Code : 24ZB3MC06 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the basics of inheritance and interactions of genes.	PSO -1	K1
CO - 2	Discuss the causes of genetic makeup and phenotypic changes in progeny.	PSO - 5	K2
CO - 3	Illustrate the genic interactions, central dogma and genetic defects.	PSO - 2	K3
CO - 4	Analyze patterns of inheritance in complex genetic scenarios.	PSO - 3	K4
CO - 5	Compile the factors which contribute to changes in gene expression.	PSO -4	K5

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

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

Semester: III				**GENETICS**							**Hours: 4**
Code : 24ZB3MC06											**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	4	3	3	5	4	4	3	3	3.73
CO - 2	3	3	4	3	5	5	3	4	3	3	5	3.73
CO - 3	4	3	5	3	4	4	4	5	3	3	4	3.82
CO - 4	3	3	4	5	3	3	3	4	5	3	3	3.55
CO - 5	3	5	4	4	3	3	3	4	4	5	3	3.73
Overall Mean Score												**3.71**

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

Note:

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

Values Scaling:

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

UNIT I

Mendelian Genetics: Genetic terminology - alleles, homozygote, heterozygote, hybrid, genotype, phenotype, back cross and test cross. Mendelian Laws of inheritance - Monohybrid and dihybrid experiment. Interaction of genes - complete dominance and incomplete dominance, Epistasis - dominant and recessive epistasis, lethal genes, pleiotropism, penetrance and expressivity.

(12 Hours)

UNIT II

Inheritance Mechanisms: Multiple alleles - ABO blood grouping. Multiple genes - Skin color in man, transgressive variations. Population genetics - Hardy - Weinberg equilibrium. Extra chromosomal inheritance - Inheritance of kappa particles and shell coiling in snail. **(12 Hours)**

UNIT III

Linkage and crossing over: Linkage - types of linkage, Cis arrangement and Trans arrangement, linkage groups, theories and factors affecting linkage. Crossing over - theories of crossing over, mechanism and significance of crossing over, factors affecting crossing over. Chromosome map - procedure for the chromosome mapping, Karyotyping - an overview. **(12 Hours)**

UNIT IV

Sex linked inheritance: Types, X-linked inheritance - Colour blindness, haemophilia and Y - linked inheritance. Sex determination in man. Syndromes - Down's syndrome, Turner's syndrome and Klinefelter's syndrome. **(12 Hours)**

UNIT V

Mutation: Chromosomal mutation, Genomatic mutation and Gene mutation. Inborn errors of metabolism - phenylketonuria, alkaptonuria and albinism. Genetics and society - Pedigree analysis, twin study, eugenics, euthenics, euphenics and genetic counselling. Inbreeding and out breeding. **(12 Hours)**

COURSE BOOK:

1. Verma P.S., Agarwal V.K. Genetics, 9th revised multicolour Edition, S.Chand and Company Ltd, Ram Nagar, New Delhi, 2021.

UNIT	BOOK	CHAPTERS
I	1	9, 10, 11, 12, 14
II	1	13, 18
III	1	19, 20, 21
IV	1	25, 26
V	1	27, 28, 29

BOOKS FOR REFERENCE:

1. Gardner, E.J., Michael J. Simmons, Peter Sunstad, D, Principles of Genetics. 8th edition, John Wiley and Sons, INC 1991.
2. Benjamin Lewin, Genes VIII. Pearson Prentice Hall, Pearson Education, Inc. 2004.
3. Strickberger M.W., Genetics. 3rd edition, Macmillan Publishing Co., New Delhi. 1985.
4. Daniel L. Haartl and Elizabeth W. Jones, Genetics. 5th edition, Jones and Bartlett Publishers, Sudbury. 2001.
5. Charlotte J. Avers. Genetics. D.Van Nostrand and Company, New York, 1980.
6. Gurbachans Miglani, Narosa Publishing, Daryaganj, New Delhi, 2015.
7. Benjamin Lewin, Genes VII. 7th edition, Oxford University Press Inc., New York. 2000.
8. Verma, P.S. and Agarwal, A.K., Genetics. 9th edition, Rajendra Ravindra Printer's Pvt. Ltd., New Delhi, 2012.
9. Gardner A. and Davies T. Human genetics. 2nd edition, Viva books private limited, Ansari Road, Daraganj. 2010.
10. Dipak Kumar Kar Sona Halder, Cell Biology, Genetics, Molecular Biology. New Central Book Agency (p) Ltd, Chintamoni Das Lane, 2009.
11. Alice Marcus, Genetics. HJP Publisher, Chennai, 2009.
12. Gupta P.K., Molecular Biology and Genetic Engineering. Rastogi Publications, Meerut, 2011.
13. Primrose SB, Twyman R. Principles of Gene manipulation and Genomics. John Wiley and Sons Strickberger MW, Genetics, Pearson publishers, 2002

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CELL AND MOLECULAR BIOLOGY AND GENETICS - LAB

Semester: III **Hours: 2**

Code : 24ZB3CP02 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the principles and working mechanisms of microscope.	PSO - 2	K1
CO - 2	Interpret the different stages of mitosis and meiosis.	PSO - 1	K2
CO - 3	Apply principles of inheritance and validate the results.	PSO - 5	K3
CO - 4	Analyze Mendelian traits among the students.	PSO - 3	K4
CO - 5	Assess the different types of blood cells.	PSO -4	K5

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

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

Semester: III				**CELL AND MOLECULAR BIOLOGY AND GENETICS - LAB**							**Hours: 2**
Code : 24ZB3CP02											**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	3	5	3	2	2	4	5	3	3	2	3.27
CO - 2	5	3	4	3	3	3	5	4	3	3	3	3.55
CO - 3	3	4	3	3	5	5	3	3	3	4	5	3.73
CO - 4	2	3	4	5	3	3	2	4	5	3	3	3.36
CO - 5	3	5	3	3	4	4	3	3	3	5	4	3.64
Overall Mean Score												**3.51**

Result: The Score for this Course is **3.51** (High Relationship)

Note:

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

Values Scaling:

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

CELL BIOLOGY:

1. Study of mitosis in onion root tip cells.
2. Identification of various stages of meiosis in the testes of grasshopper.
3. Polytene Chromosome in Chironomus larva.
4. Preparation of Human buccal smear.
5. Preparation of Human blood smear.
6. DNA isolation from Buccal cell
7. Spotters:
    a. Compound Microscope
    b. Mitochondria
    c. Nucleus
    d. Endoplasmic reticulum
    e. Golgi apparatus.
    f. Watson and Crick's model of DNA
    g. DNA Replication

GENETICS:

1. Verification of Mendel's Laws by using coins / beads.
    a. Monohybrid cross
    b. Monohybrid test cross.
    c. Dihybrid cross
    d. Dihybrid test cross.
2. Study of Mendelian traits among the students.
3. Determination of blood group of man
4. Identification of the following using charts.
    a. Down's syndrome
    b. Turner's syndrome
    c. Klinefelter's syndrome.
    d. Pedigree analysis

GENERAL BOTANY - I

Semester: III **Hours: 3**

Code : 24BO3AC3A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember the plant anatomy and basic cell structure.	PSO - 1	K1
CO - 2	Understand the nature of various types of plant tissues and diseases.	PSO - 5	K2
CO - 3	Apply the knowledge of plant diseases and address the issues.	PSO - 2	K3
CO - 4	Analyze the plant diversity based on anatomical structure.	PSO - 3	K4
CO - 5	Evaluate the economic importance and life cycle of algae, fungi and bryophytes.	PSO -4	K5

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

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

Semester: III				**GENERAL BOTANY - I**							**Hours: 3**
Code : 24BO3AC3A											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	2	3	4	3	3	5	3	4	2	3	3.36
CO - 2	4	4	4	3	5	5	4	4	3	4	5	4.09
CO - 3	3	3	5	2	2	2	3	5	2	3	2	2.91
CO - 4	4	3	2	5	2	2	4	2	5	3	2	3.09
CO - 5	4	5	3	2	3	3	4	3	2	5	3	3.36
Overall Mean Score												**3.36**

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

Note:

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

Values Scaling:

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

UNIT I

Histology: Ultra structure of a plant cell. Tissues - Meristematic tissues, theories on differentiation of meristems. Permanent tissues - Simple tissues - Parenchyma, Collenchyma, and Sclerenchyma, Complex tissues - Xylem and Phloem. Internal structure of primary young dicot stem, root and leaf. Internal structure of monocot stem and root. **(9 Hours)**

UNIT II

Phycology: Introduction, salient features and economic importance of Algae. Chlorella - occurrence, structure, reproduction - asexual method, economic significance, and life cycle. Sargassum - occurrence, thallus structure, internal structure of stipe, leaf, and cryptoblasts, reproduction - vegetative and sexual method and life cycle. **(9 Hours)**

UNIT III

Mycology: Introduction, general characters - classification, Economic importance of Fungi. Rhizopus - occurrence, structure, reproduction - vegetative, asexual and sexual method, economic importance and life cycle. Saccharomyces (Yeast) - structure, nutrition, economic importance, reproduction - vegetative, asexual, and sexual method, life cycle - haplobiontic, diplobiontic, and haplo - diplontic.

(9 Hours)

UNIT IV

Bryology: Introduction, general characters of Bryophytes. Funaria - occurrence, structure of gametophyte, internal structure of stem and leaf, reproduction - vegetative and sexual method, sporophyte - foot, seta and capsule, dehiscence of the capsule, spore germination and life cycle. **(9 Hours)**

UNIT V

Pathology: Introduction, plant immunity, a detailed study on the causal organisms, symptoms, dissemination, and control measures of citrus canker, bunchy top of banana, tikka disease of groundnut, ring rot of potato, and little leaf of brinjal.

(9 Hours)

COURSE BOOKS

1. Pandey B. P, College Botany: Alge, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta, S. Chand Publishing, India,2014
2. Singh. V, Pande. P. C, and Jain. D.K, A textbook of Botany Angiosperms, 5th Edition, Rastogi Publication, Shivaji Road, Meerut,2020
3. Amit Jain, Microbiology and Phycology, Mahaveer Publications, India.2020
4. Swapnil Yadav, Mycology and Phytopathology, Mahaveer Publications, India,2020

UNIT	BOOK	CHAPTERS
I	2	II
II	1, 4	I, II
III	1, 3	II, II
IV	1	VIII
V	1, 4	VI, III

BOOKS FOR REFERENCE:

1. Vashishta, B. R. Sinha A. K. and Singh, V.P. Botany for Degree students Algae. S. Chand and Company, Ltd, New Delhi, 2002.
2. Vashishta, B. R. and Sinha, A. K., Botany for Degree students Fungi. S. Chand and Company, Ltd, New Delhi, 2003.
3. Robert Edward Lee, Phycology. Cambridge University Press, 2009.
4. Vashishta B. R. Sinha A. K. and Sinha V. P. Bryophyta. S. Chand and Co. Ltd., New Delhi, 2006.
5. Pandey, B. P. Plant Pathology. S. Chand and Co. Ltd., New Delhi, 2007.

ETHNOBOTANY AND MEDICINAL BOTANY

Semester: III **Hours: 3**

Code : 24BO3AC3B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember ethnobotanical specimens and their role.	PSO -1	K1
CO - 2	Understand the principles and contributions of indigenous medicinal sciences.	PSO - 2	K2
CO - 3	Apply the concept of sharing wealth to protect traditional knowledge.	PSO - 4	K3
CO - 4	Analyze the role of ethnobotany in the conservation of plant genetic resources.	PSO - 5	K4
CO - 5	Evaluate the ethical considerations related to biopiracy and intellectual property.	PSO - 3	K5

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

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

Semester: III				**ETHNOBOTANY AND MEDICINAL BOTANY**							**Hours: 3**
Code : 24BO3AC3B											**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	2	3	3	5	3	2	4	3	3.36
CO - 2	4	3	5	2	3	3	4	5	2	3	3	3.36
CO - 3	4	5	3	2	4	4	4	3	2	5	4	3.64
CO - 4	3	3	3	2	5	5	3	3	2	3	5	3.36
CO - 5	2	3	3	5	4	4	2	3	5	3	4	3.45
Overall Mean Score												**3.43**

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

Note:

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

Values Scaling:

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

UNIT I

Ethnobotany: Introduction, concept, scope, and objectives. Ethnobotany as an interdisciplinary science. Major and minor ethnic groups or Tribals of India and their lifestyles. **(9 Hours)**

UNIT II

Role of ethnobotany in modern Medicine: Medico-ethnobotanical sources in India. Significance of the following plant in ethno botanical practices - *Vitex negundo*, *Cassia auriculata, Indigofera tinctoria, Senna auriculata, and Phyllanthus niruri*. Role of ethnic groups in the conservation of plant genetic resources.

(9 Hours)

UNIT III

Ethnobotany as a tool to protect interests of ethnic groups: Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge - uses and applications of TKDL

(9 Hours)

UNIT IV

Indigenous Medicinal Sciences: Definition and scope, Ayurveda - History, origin, plants used in Ayurvedic treatments. Siddha - origin of Siddha medicinal systems, basic of Siddha system, plants used in Siddha medicine. Unani - History, tumors treatments/therapy. **(9 Hours)**

UNIT V

Conservation of endangered and endemic medicinal plants: Definition: endemic and endangered medicinal plants. In-situ conservation - Biosphere reserves, scared groves, National Parks. Ex-situ conversation - Botanical Gardens.

(9 Hours)

COURSE BOOKS:

1. Srivastava, A.K. Medicinal Plants: Biodiversity, Conservation and Traditional Knowledge, Swastik Publications, 2010.
2. Light Miller, Ayurveda & Aromatherapy: The Earth Essential Guide to Ancient Wisdom and Modern Healing. Motilal Banarsidass Publications 4th edition, 2017.
3. Patri, F and Silano, V, Plants in cosmetics: Plants and plant preparations used as ingredients for cosmetic products - Volume 1, 2002.
4. Dilip Kalita and Manashi Dutta, Ethnobotany, Mahaveer Publications, 1st Edition, 2024.

UNIT	BOOK	CHAPTERS
I	4	VI
II	4	III
III	4	IV
IV	2, 3	II, IV
V	1	I

BOOKS FOR REFERENCE:

1. Anita Jain and Jain S. K. Indian Ethnobotany, Scientific Publishers, Jodhpur, 2016.
2. Jain S. K. Manual of Ethnobotany, Scientific Publishers 2nd Revised Edition, Jodhpur, 2018.
3. Colton C. M. Ethnobotany - Principles and Applications. John Wiley and sons - Chichester, 1997.
4. Rama Ro, N. and Henry, A. N. The Ethnobotany of Eastern Ghats in Andhra Pradesh, India. Botanical Survey of India. Howrah, 1996.

GENERAL BOTANY - I - LAB

Semester: III **Hours: 2**

Code : 24BO3AP3A **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember the structure of essential plant tissues	PSO - 1	K1
CO - 2	Understand the cellular structure and life cycle of algae, fungi, and bryophytes	PSO - 2	K2
CO - 3	Apply the sectioning and mounting techniques to study the anatomy	PSO - 3	K3
CO - 4	Analyze the impact of plant health on agricultural practices	PSO - 5	K4
CO - 5	Evaluate the ecological roles of algae, fungi, and bryophytes	PSO - 4	K5

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

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

Semester: III				**GENERAL BOTANY -I - LAB**							**Hours: 2**
Code : 24BO3AP3A											**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	2	4	4	5	3	2	2	4	3.27
CO - 2	4	2	5	3	3	3	4	5	3	2	3	3.36
CO - 3	2	3	4	5	2	2	2	4	5	3	2	3.09
CO - 4	3	3	3	2	5	5	3	3	2	3	5	3.36
CO - 5	3	5	4	2	3	3	3	4	2	5	3	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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

SECTIONING AND MOUNTING

1. Dicot stem - *Tridax procumbens*
2. Monocot stem - *Asparagus racemosus*
3. Monocot root - *Canna indica*

SLIDES

1. **Plant Anatomy:** Parenchyma cell, Collenchyma cell and Sclerenchyma cell.
2. **Algae:** Chlorella cell, Sargassum - Male conceptacle and Female conceptacle.
3. **Fungi:** Cell structure of Yeast.
4. **Bryophytes:** Funaria - L. S. of Antheridial branch, L. S. of Archegonial branch and L. S. of Capsule.

SPOTTERS

1. Funaria - Habit
2. Sargassum - Habit
3. Citrus canker disease
4. Bunchy top of banana disease
5. Ring rot of potato disease
6. Little leaf of brinjal disease

CHARTS

1. Ultra structure of a plant cell
2. Dicot Root

ETHNOBOTANY AND MEDICINAL BOTANY - LAB

Semester: III **Hours : 2**

Code : 24BO3AP3B **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define ethnobotanical specimens and their role in understanding traditional medicine	PSO - 1	K1
CO - 2	Demonstrate the importance and utilization of ethno-medicine	PSO - 4	K2
CO - 3	Apply the ethical considerations and cultural sensitivity during field visits to local tribal areas	PSO - 3	K3
CO - 4	Analyze the morphological and anatomical characteristics of the various plant parts	PSO - 2	K4
CO - 5	Evaluate the diversity of ethnomedicinal plant	PSO - 5	K5

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

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

Semester: III				**ETHNOBOTANY AND MEDICINAL BOTANY - LAB**							**Hours: 2**
Code : 24BO3AP3B											**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	2	2	3	3	5	2	2	4	3	3.18
CO - 2	3	5	2	2	4	4	3	2	2	5	4	3.27
CO - 3	2	3	3	5	3	3	2	3	5	3	3	3.18
CO - 4	4	3	5	2	2	2	4	5	2	3	2	3.09
CO - 5	3	3	3	2	5	5	3	3	2	3	5	3.36
Overall Mean Score												**3.22**

Result: The Score for this Course is **3.22** (High Relationship)

Note:

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

Values Scaling:

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

1. Ethnobotanical specimens as prescribed in the theory syllabus.
2. Detailed morphological and anatomical study of the medicinally important part(s) of locally available plants (minimum 8 plants) used in traditional medicine.
3. Field visits to identify and collect ethno medicinal plants used by local tribes/folklore.
4. Documentation of knowledge on common medicinal plants - report submission.

SEC -2: FERMENTED FOODS AND BEVERAGES

Semester: III **Hours: 1**

Code : 24SE3ZB03 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the types of fermentation and fermented food	PSO -1	K1
CO - 2	Explain the role of microorganisms in fermentation	PSO - 2	K2
CO - 3	Apply the science and techniques in making new fermented products	PSO - 4	K3
CO - 4	Analyze the nutritional, culinary, safety and preservation aspects of fermented products	PSO - 3	K4
CO - 5	Determine the best production and preserving practices of fermented foods	PSO - 5	K5

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

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

Semester: III	SEC -2: FERMENTED FOOD AND BEVERAGES										Hour: 1
Code : 24SE3ZB03											Credit: 1
Course Outcomes	Programme Outcomes (PO)						Programme Specific Outcomes (PSO)				Mean Score of CO's
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	4	4	3	2	2	5	4	3	4	2	3.45
CO - 2	4	3	5	4	2	2	4	5	4	3	2	3.45
CO - 3	4	5	3	3	2	2	4	3	3	5	2	3.27
CO - 4	3	3	4	5	2	2	3	4	5	3	2	3.27
CO - 5	4	3	4	2	5	5	4	4	2	3	5	3.73
Overall Mean Score												3.43

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

Note:

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

Values Scaling:

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

UNIT I

Introduction to Fermentation: History and types of fermentation, role of bacteria, yeast, molds and other factors in fermentation **(3 Hours)**

UNIT II

Fermented Dairy and Beverages: Introduction to Fermenters - Production and health benefits of yogurt, kefir, cheese, buttermilk, beer, wine and kombucha. Probiotics - types and health benefits of probiotics **(3 Hours)**

UNIT III

Fermented Vegetables: Production of sauerkraut, traditional kimchi, pickles, sourdough starter and maintenance. **(3 Hours)**

UNIT IV

Fermented Condiments and Sauces: Production of mayonnaise, soy sauce, hot sauces and miso development of umami and flavor. **(3 Hours)**

UNIT V

Food safety and preservation: Introduction to Food safety - Importance of Food safety, Food Safety Guidelines, Food Preservation - Salting, Vacuum packing and freezing. **(3 Hours)**

COURSE MATERIAL:

- S. Catherine. Alexander, C. Sagaya Rani, M.R. Delphine Rose, A, V. Jemima Florence Borgia, S. Iruthaya Kalai Selvam, L. Merlin Dayana, A. Irudaya Lourdu Gladis, I. Geetha, F.Sherin Rebecca, S. Devashanthi, M.Velankanny, ‘‘Fermented Foods and Beverages’’ I edition, RG International Publications, 2024.

GENERIC ELECTIVE-1
TECHNIQUES IN PROJECT SCHEDULING

Semester: III **Hours: 2**

Code : 24MA3GE01 **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 : 24MA3GE01											**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 = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$	Mean Overall Score for COs= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UNIT I

Introduction - 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 the Department.

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

PHYSICS OF MUSIC

Semester: III **Hours: 2**

Code : 24PH3GE01 **Credit: 2**

COURSE OUTCOMES:

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

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

Semester: III				**#PHYSICS OF MUSIC**							**Hours: 2**
Code : 24PH3GE01											**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	2	3	3	5	5	4	3	2	3.55
CO - 2	5	4	3	3	2	2	5	5	3	2	2	3.27
CO - 3	5	4	3	2	3	2	3	5	5	5	2	3.55
CO - 4	5	4	4	3	3	2	3	2	5	5	2	3.45
CO - 5	5	4	4	2	2	2	2	3	4	5	5	3.45
Overall Mean Score												**3.45**

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

Note:

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

Values Scaling:

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

UNIT I: SCIENTIFIC STUDY OF MUSIC

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

UNIT II: SIMPLE VIBRATING SYSTEMS

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

UNIT III: MUSICAL TONE

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

UNIT IV: STANDING WAVES AND INSTRUMENTS

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

(6 Hours)

UNIT V: CLASS ROOM ACTIVITIES

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

(6 Hours)

COURSE BOOKS:

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

  UNIT I: Chapter1: 1.1- 1.4

  UNIT II: Chapter 2: 2.1-2.2

  UNIT III: Chapter 2: 2.2-2.4

  UNIT IV: Chapter 3: 3.1-3.2

  UNIT V: Activities included in the book

BOOKS FOR REFERENCE:

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

DEPARTMENT OF CHEMISTRY
APPLIED CHEMISTRY #

Semester: III **Hours: 2**
Code : 24CH3GE01 **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 food chemistry pest management and fertilizer, polymer, sugar manufacturing process, consumer products of cottage goods and the intellectual property rights	PSO-1	K1
CO - 2	Explain the manufacturing techniques of food products, pest, fertilizer, sugar and consumer products	PSO-3	K2
CO - 3	Apply the skills on identifying food adulteration techniques, pest management and cottage goods manufacturing process	PSO-2	K3
CO - 4	Analyse the significant role of chemistry in food materials and consumer products	PSO-4	K4
CO - 5	Assess the various techniques involved in applied chemistry	PSO-5	K5

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

Semester: III				**APPLIED CHEMISTRY #**							**Hours: 2**
Code : 24CH3GE01											**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	4	4	3	4	5	4	2	4	3	3.64
CO - 2	2	5	4	4	3	4	2	4	5	4	3	3.64
CO - 3	3	3	5	5	3	4	3	5	3	4	3	3.73
CO - 4	3	3	2	2	4	5	3	2	3	5	4	3.27
CO - 5	3	3	4	4	5	4	3	4	3	4	5	3.82
Overall Mean Score												**3.62**

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

Note:

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

Values Scaling:

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

UNIT I: a) FOOD PROCESSING:

Introduction - cooking - advantages of cooking - food spoilage - food preservation - refrigeration and freezing - canning - dehydration: freeze-drying, salting, pickling, fermenting - chemical preservatives: citric acid - EDTA - heptyl paraben - lecithin

b) FOOD ADULTERATION AND TESTING:

Introduction - legal aspects of food adulteration and prevention in WHO - common food adulterants - analysis of various food adulterants: edible oils, ghee, coffee powder, chilly powder, turmeric powder, meat and milk - harmful effect of the adulterants **(6 Hours)**

UNIT II: FERTILIZERS AND PEST MANAGEMENT:

Plant nutrients - definition - nutrient for plant growth - natural and chemical fertilizers - classification - pest management - insecticides - pesticides - fungicides - definition - classification and mode of action **(6 Hours)**

UNIT III: SUGAR INDUSTRY:

Introduction - extraction of juice - purification - defecation - carbonation and sulphitation - concentration - crystallization - separation of crystals - refining - recovery of sugar from molasses - manufacture of ethanol from molasses by fermentation **(6 Hours)**

UNIT IV: POLYMERS:

Fibers - natural fibers: cotton, wool, silk, artificial fibers: rayon, nylon - rubber: natural rubber - vulcanization - synthetic rubbers: preparation and uses of buna rubbers and neoprene - commercial plastics: preparation, uses of polyethylene, PET, PVC, Polypropylene, Bakelite and Teflon **(6 Hours)**

UNIT V: a) COTTAGE INDUSTRIAL GOODS:

Preparation and uses: cleaning powder - shampoo - ink - phenyl - washing powder - candle - rose water - pain balm and hand sanitizer

b) INTELLECTUAL PROPERTY RIGHTS:

Introduction - definitions - importance of intellectual property - types of intellectual property: definition of copyright, patent, trademark and industrial designs

(6 Hours)

COURSE BOOK

Study material prepared by the PG and Research Center of Chemistry

BOOKS FOR REFERENCE:

1. B.K. Sharma, Industrial Chemistry, Goel Publishing House, 13th Edition, 2002.
2. Alex V Ramani, Food Chemistry, MJP Publishers, 2021.
3. P. L. Soni and H.M. Chawla, Textbook of Organic chemistry, 2022, 29th Edition, Sultan Chand and Sons Educational Publishers.
4. P. L. Soni and Mohan Katyal, Textbook of Inorganic Chemistry, 2007, 20th Edition, Sultan Chand and Sons Educational Publishers.
5. Neeraj Pandey, Khushdeep Dharni, Intellectual Property Rights, PHI Learning, 2014.

DEPARTMENT OF COMPUTER SCIENCE

MARKUP AND SCRIPTING LANGUAGES-LAB

Semester: III **Hours: 2**
Code : 24CS3GE01 **Credit: 2**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember the basics of HTML, CSS, Java Script and VBScript codes.	PSO-1	K1
CO - 2	Understand the HTML, CSS, Java Script and VBScript codes.	PSO-2	K2
CO - 3	Apply the HTML, CSS, Java Script and VBScript codes.	PSO-4	K3
CO - 4	Analyze the HTML, CSS, Java Script and VBScript codes.	PSO-3	K4
CO - 5	Evaluate the HTML, CSS, Java Script and VBScript codes.	PSO-5	K5

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

Semester: III				**MARKUP AND SCRIPTING LANGUAGES-LAB**							**Hours: 2**
Code : 24CS3GE01											**Credit:2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	3	3	4	4	5	5	4	4	3	3	3.82
CO - 2	2	3	4	5	5	4	4	5	2	3	4	3.73
CO - 3	3	5	3	2	2	3	3	2	3	5	3	3.09
CO - 4	5	3	2	3	3	4	4	3	5	3	2	3.36
CO - 5	2	3	5	4	4	3	3	4	2	3	5	3.45
Overall Mean Score												**3.49**

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

Note:

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

Values Scaling:

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

LIST OF PRACTICALS

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

DEPARTMENT OF COMPUTER APPLICATION

ANIMATION LAB

Semester: III **Hours: 2**

Code : 24CA3GE01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	K LEVEL
CO - 1	Acquire the skills of using the drawing tools	PSO -1	K1
CO - 2	Understand the different types of Animation	PSO - 4	K2
CO - 3	Use the drawing and animation skills to create effective animations	PSO - 5	K3
CO - 4	Analyze the different types of animation and their suitability in real-time scenarios	PSO - 2	K4
CO -5	Create short story with animation and sound effects	PSO - 3	K5

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

Semester: III			**ANIMATION LAB**						**Hours: 2**			
Code : 24CA3GE01												**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	3	4	3	4	3	5	5	3	3	4	3	3.64
CO - 2	3	4	5	3	5	3	4	5	3	3	3	3.73
CO - 3	5	3	3	4	3	4	3	3	4	3	5	3.64
CO - 4	3	5	3	3	2	3	3	4	3	5	3	3.36
CO -5	3	3	3	5	3	3	3	3	5	3	4	3.45
Overall Mean Score												**3.56**

Result: The score for this course is **3.56** (High Relationship)

Note:

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

Values Scaling:

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

LIST OF EXERCISES

1. Drawing Objects using Tools
2. Frame-by-Frame Animation
3. Classic Tween Animation
4. Motion Tween Animation
5. Shape Tween Animation
6. Multilayer Animation
7. Guide Layer Animation
8. Mask Layer Animation
9. Animation using Sound Effects
10. Animation Using Buttons
11. Short Story Creation with Animation and Sound Effects

AEC-3 ENVIRONMENTAL STUDIES

Semester: III **Hours: 2**

Code : 24AE3ES03 **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 : 24AE3ES03											**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	4	5	5	3	4	3	5	4	4	3	3.91
CO - 3	3	5	3	3	4	3	3	3	5	3	4	3.55
CO - 4	3	3	3	3	4	5	3	3	3	5	4	3.55
CO - 5	3	3	3	3	5	4	3	3	3	4	5	3.55
Overall Mean Score												**3.58**

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

Note:

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

Values Scaling:

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

UNIT I: 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: 24GT4GS04 **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**					**Hours: 6**
Code : 24GT4GS04						**(பிற துறை மாணவிகளுக்கு மட்டும்)**					**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	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 - 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: 6**

Code : 24GH4GS04 **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 **(18 Hours)**

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

UNIT II **(18 Hours)**

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

UNIT III **(18 Hours)**

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

UNIT IV **(18 Hours)**

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

UNIT V **(18 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 : 24GE4GS04 **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 : 24GE4GS04											**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 = 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**

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

ANIMAL PHYSIOLOGY

Semester: IV **Hours: 6**

Code : 24ZB4MC07 **Credit: 6**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the principles and basic facts of Animal Physiology.	PSO - 1	K1
CO - 2	Explain the anatomical structure of different organs and organ systems.	PSO - 2	K2
CO - 3	Illustrate the physiological process of different organs and aspire for a vibrant life style.	PSO - 3	K3
CO - 4	Survey the malfunctioning of different organs and organ systems.	PSO - 4	K4
CO - 5	Evaluate the significance of specific organ functions in maintaining homeostasis and considering their role in health.	PSO - 5	K5

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

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

Semester: IV				**ANIMAL PHYSIOLOGY**							**Hours: 6**
Code : 24ZB4MC07											**Credit: 6**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	4	4	2	4	4	5	4	2	4	4	3.82
CO - 2	3	4	5	3	4	4	3	5	3	4	4	3.82
CO - 3	3	3	4	5	3	3	3	4	5	3	3	3.55
CO - 4	3	5	4	3	4	4	3	4	3	5	4	3.82
CO - 5	3	4	4	3	5	5	3	4	3	4	5	3.91
Overall Mean Score												**3.78**

Result: The Score for this Course is **3.78** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Nutrition and Respiration: Nutrition - types of nutrition found among organisms, kinds of digestion, structure of human digestive tract, digestion and absorption of carbohydrates, proteins and lipids, hormonal control of digestion, digestive disorders - Peptic ulcer, Gastroesophageal reflux disease. Respiration - kinds of respiration, structure of respiratory organ in man, respiratory pigments, transportation of respiratory gases, regulation of respiration, respiratory disorders - Bronchitis, Asthma, Hypoxia, Hypercapnia. **(18 Hours)**

UNIT II

Circulation and Excretion: Circulation - composition of blood, mechanism of clotting, types of hearts, structure of human heart, pace maker, cardiac cycle, blood pressure, ECG, bradycardia, tachycardia. Excretion - structure of kidney, nephron, mechanism of urine formation, excretory products, dialysis, nephritis and blood urea. **(18 Hours)**

UNIT III

Muscle and Nerve Physiology: Muscle - types, ultra structure of striated muscle, mechanism of muscle contraction, physico chemical changes during muscular contraction, tetanus, fatigue. Nerve - neuron structure and types, conduction of impulse through nerve fibre, synapse and neuromuscular junction, reflex action, Neural disorders - Epilepsy, Alzheimer's disease, Parkinson's disease. **(18 Hours)**

UNIT IV

Sense organs: Eye - structure of eye, physiology of vision, visual elements and pigments, photo chemistry of vision, eye defects - myopia, hyperopia, presbyopia, astigmatism, cataract, night blindness and colour blindness. Ear - structure of ear and mechanism of hearing, hearing impairments - deafness and labyrinthine disease. Olfactory, Gustatory and Lateral line sense organs. **(18 Hours)**

UNIT V

Endocrinology and Regulatory Physiology: Endocrine glands in man - hormones, action and disorders of pituitary, thyroid, adrenal, islets of Langerhans, testis and ovary. Osmoregulation in fishes, mechanism of thermoregulation. **(18 Hours)**

COURSE BOOK:

1. Verma P.S, Tyagi B.S., Agarwal V.K., Animal Physiology. S. Chand & Company Ltd., New Delhi, 2002.

UNIT	BOOK	CHAPTER
I	1	5,8
II	1	11,9
III	1	12,13
IV	1	15
V	1	10,14

BOOKS FOR REFERENCE:

1. Eckert and Randall Animal Physiology Mechanism and Adaptations, 2nd edition, CBS Publishers and Distributors, New Delhi, 2000.
2. Rastogi S.C, Essentials of Animal Physiology, 4th Edition, New Age International (P) Limited, Publishers, New Delhi, 2007.
3. Nagabhushanam R., Kodarkar M. S and Sarojini R., Text Book of Animal physiology, 2nd edition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 2002.
4. Goyal Sastry, Animal physiology, 6th edition, Rakesh Kumar Rastogi for Rastogi Publications, Meerut, India, 2014.
5. Ladd Prosser C, Comparative Animal Physiology, 3rd edition, Satish Book Enterprise Book Sellers and Publishers, Agra, 1992.
6. Knut Schmidt-Nielson, Animal Physiology (Adaptation and environment), 5th edition, Cambridge university Press, New Delhi, 1997.
7. Sobit R.C., Animal physiology, Narosa Publishing house, New Delhi, 2008.
8. Dee Unglaub Silverthorn, Human physiology an integrated approach, 5th Edition, Published by Pearson Education, 2010.
9. Biswas P.K., Hand book of Animal Physiology, Agrotech Press, New Delhi, 2013.
10. Arumugam N and Mariakuttikan A, Animal Physiology, 12th edition, Saras Publication, Nagercoil, 2019.

ANIMAL PHYSIOLOGY - LAB

Semester: IV **Hours: 3**

Code : 24ZB4CP03 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Examine the oxygen consumption in fish.	PSO - 1	K1
CO - 2	Identify the nitrogenous excretory products in animal and qualitatively analyze the albumin, bile salt, bile pigment, sugar and ketone bodies in urine.	PSO - 3	K2
CO - 3	Prepare haemin crystals.	PSO - 5	K3
CO - 4	Analyze the effect of temperature on opercular movement in fish.	PSO - 2	K4
CO - 5	Estimate the blood pressure and hemoglobin content in human.	PSO - 4	K5

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

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

Semester: IV				**ANIMAL PHYSIOLOGY - LAB**							**Hours: 3**
Code : 24ZB4CP03											**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	4	3	3	3	5	4	3	3	3	3.55
CO - 2	2	4	4	5	4	4	2	4	5	4	4	3.82
CO - 3	2	3	4	4	5	5	2	4	4	3	5	3.73
CO - 4	3	2	5	3	3	3	3	5	3	2	3	3.18
CO - 5	3	5	4	4	4	4	3	4	4	5	4	4.00
Overall Mean Score												**3.66**

Result: The Score for this Course is **3.66** (High Relationship)

Note:

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

Values Scaling:

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

1. Estimation of oxygen consumption in fish.
2. Identification of nitrogenous waste - ammonia, urea and uric acid.
3. Determination of opercular movement in fish in relation to temperature.
4. Estimation of blood pressure.
5. Preparation of haemin crystals.
6. Estimation of hemoglobin in human.
7. Qualitative analysis of albumin, bile salt, bile pigment, sugar and ketone bodies in the urine.

SPOTTERS:

1. Haemoglobinometer
2. Sphygmomanometer
3. Electrocardiogram
4. Striated muscle
5. Non-striated muscle
6. Cardiac muscle
7. Neuron
8. Nephron.

GENERAL BOTANY - II

Semester: IV **Hours: 3**
Code : 24BO4AC4A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember the economic significance of various plants in agriculture and horticulture	PSO - 5	K1
CO - 2	Understand the plant physiology, morphology, and classification systems	PSO - 2	K2
CO - 3	Apply the knowledge of taxonomy, physiology, horticulture, and applied botany	PSO - 1	K3
CO - 4	Analyse the horticultural practices for economic improvement	PSO - 4	K4
CO - 5	Evaluate the practical skills in taxonomy, propagation, and economically value of plants	PSO - 3	K5

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

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

Semester: IV				**GENERAL BOTANY - II**							**Hours: 3**
Code : 24BO4AC4A											**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	4	2	2	5	5	3	2	2	4	5	3.36
CO - 2	3	4	5	2	4	4	3	5	2	4	4	3.64
CO - 3	5	3	3	3	4	4	5	3	3	3	4	3.64
CO - 4	2	5	3	2	4	4	2	3	2	5	4	3.27
CO - 5	3	4	2	5	3	3	3	2	5	4	3	3.36
Overall Mean Score												**3.45**

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

Note:

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

Values Scaling:

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

UNIT I

Taxonomy: Introduction and scope of Plant Taxonomy. Outlines of Bentham and Hooker's system of classification, merits and demerits. distinguishing characters, distribution, vegetative characters and floral characters and one example of the following families with economic importance. Annonaceae - (*Annona squamosa)*, Rutaceae - (*Murraya koenigii)*, Asclepiadaceae - (*Calotropis gigantea)*, Euphorbiaceae - (*Euphorbia heterophylla)* and Poaceae - (*Oryza sativa)*. **(9 Hours)**

UNIT II

Plant Physiology: Transpiration - types of transpiration, structure and functions of stomata, mechanism of opening and closing, stomatal transpiration, transpiration as a necessary evil, factors affecting transpiration - internal and external factors, Antitranspirants and significance of transpiration. Photosynthesis - light reaction. photoperiodism - short day plants, long day plants, day neutral plants and significance of photoperiodism. **(9 Hours)**

UNIT III

Horticulture: Introduction to horticulture, Propagation - definition, methods of vegetative propagation. Cuttage - root, stem, leaf, and leaf bud cutting. Layerage - ground and air layering. Graftage - methods of grafting - approach, whip, cleft, and top grafting. Planning and layout - orchards and kitchen garden. Indoor gardening - hanging baskets. Storage of fruits - methods of storage. **(9 Hours)**

UNIT IV

Economic Botany: Detailed study on the botanical name, the morphology of the useful parts, and uses of Cereal (Sorghum), Pulse (Black gram), Fruit (Pineapple), Beverage (Coffee seed), Fiber (Cotton), Latex (Rubber) and Essential oil (Castor seed). **(9 Hours)**

UNIT V

Applied Botany: Mushroom cultivation - nutritional value, importance, storage, and cultivation of oyster mushroom. Biopesticides - Neem. Biodiesel - Jatropha. Taxonomy, morphology of useful parts, chemical composition, and medicinal value of Acanthaceae (*Adhatoda vasica)*, Liliaceae (*Aloe vera*), Lamiaceae (*Ocimum sanctum)* and Apocynaceae *(Vinca rosea).* **(9 Hours)**

COURSE BOOKS:

1. Sharma, O.P, Plant Taxonomy, II Edition. The McGraw Hill Education Ptd, Noida, 2017
2. Singh. V, Pande. P. C, and Jain D.K. A textbook of Botany Angiosperms, 5th Edition, Rastogi Publication, Shivaji Road, Meerut, 2020
3. Verma, V, Textbook of Plant Physiology, 2nd Edition, Athena Academic Publications, New Delhi, 2008
4. Parthasarathy. V. A, Bose, T.K. and Mitra and Sadhu, Propagation of tropical and subtropical horticultural crops. Naya Prakash, 2005
5. Srivastava, A.K. Medicinal Plants, International Book Distributors, Dehradun, 2005

UNIT	BOOK	PAGE NUMBERS
I	1, 2	I, II
II	3	II
III	4	XI
IV	2	III
V	5	VI

BOOKS FOR REFERENCE:

1. Samuel, B.J. Taxonomy of Angiosperms, S. Chand & Co. Ltd, 2013.
2. Annie Ragland, Rajakumar. K, Jayakumar. M and Rajarathinam K. Plant Physiology. Saras Publication, Nagercoil, 2011.
3. Pandy, H. P. Plant Taxonomy, Silver line Publications. New Delhi, 2009.
4. Sathish Kumar Mehla, Biofuel plants cultivation practices and seed bank, Pointer Publishers, Jaipur, 2007.
5. Suresh Kumar, Economic Botany, Campus book, International, New Delhi, 2006. Trivedi, P. C. Applied Botany, Aavishkar Publishers, Jaipur, 2005.

APPLIED BOTANY

Semester: IV **Hours: 3**
Code : 24BO4AC4B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember the fundamentals of nursery management, planning, and seasonal activities	PSO - 1	K1
CO - 2	Understand the principles of gardening, landscape, home and park design	PSO - 2	K2
CO - 3	Apply the knowledge of horticulture and aspire for economic improvement	PSO - 4	K3
CO - 4	Analyze the diversity of floriculture and different types of gardens	PSO - 3	K4
CO - 5	Evaluate the use of technology in landscaping and horticultural practices	PSO - 5	K5

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

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

Semester: IV				**APPLIED BOTANY**							**Hours: 3**
Code : 24BO4AC4B											**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	2	2	3	3	5	2	2	3	3	3.00
CO - 2	2	4	5	2	3	3	2	5	2	4	3	3.18
CO - 3	2	5	2	3	4	4	2	2	3	5	4	3.27
CO - 4	3	4	2	5	3	3	3	2	5	4	3	3.36
CO - 5	2	4	2	3	5	5	2	2	3	4	5	3.36
Overall Mean Score												**3.23**

Result: The Score for this Course is **3.23** (High Relationship)

Note:

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

Nursery: Definition, objectives, scope and building up of infrastructure for nursery. Planning and seasonal activities - planning, direct seedling and transplants. Nursery management and routine garden operations. **(9 Hours)**

UNIT II

Gardening: Definition, objectives and scope - different types of gardening. Landscape and home gardening - parks and its components, plant materials and design. Computer applications in landscaping. Gardening operations - soil laying, manuring and watering. Some famous gardens of India. **(9 Hours)**

UNIT III

Horticulture: Special features, divisions**,** importance, and scope of horticulture, classification of horticultural crops, fruits, and vegetables. Use of plant growth regulators in horticulture. Induction of rooting, flowering, fruit set, fruit development, and control of fruit crops. **(9 Hours)**

UNIT IV

Propagation Method: Sexual Propagation - Seed Propagation method. Vegetative Propagation - Cutting, layering, budding, and grafting. Stock- Scion relationship in important horticultural crops. Micropropagation - Stages of micropropagation, callus, shoot, and root formation, factors affecting and applications of micropropagation. **(9 Hours)**

UNIT V

Floriculture: A brief knowledge of annuals, biennials and perennials regarding ornamental gardens. Types of gardens - formal garden, informal garden, kitchen garden, water garden and terrace garden. Greenhouse, Landscape, Terrarium, Rockery plants, Bonsai techniques and Hydroponics. **(9 Hours)**

COURSE BOOK:

1. Veena Amarnath, Nursery and Landscaping, Agrobios Publishers, New Delhi, India,2007
2. Edward Buts and Karl Stensson, Sheridan Nurseries: One hundred years of People, Plans, and Plants. Dundurn Group Ltd, 2012

UNIT	BOOK	CHAPTERS
I	1, 2	V, II, III
II	1, 2	VII, V
III	1	III
IV	1	IV
V	1	XII

BOOKS FOR REFERENCE:

1. Bose, T. K and Mukherjee, D, Gardening in India, Oxford & IBH Publishing C. Ltd., New Delhi,1972.
2. Sandhu, M. K. Plant Propagation, Wile Eastern LTD., Bangalore, Madras, 1989.
3. Kumar, N. Introduction to Horticulture, Rajalakshmi Publications, Nagercoil, 1997.
4. Randhawa, G. S. & Mukhopadhyay, A. Floriculture in India. Allied Publishers, 1986.
5. Janick Jules. Horticultural Science. 3rd edition, W.H. Freeman and Co., San Francisco, USA, 1979.
6. Edmond Musser and Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.

GENERAL BOTANY - II - LAB

Semester: IV **Hours: 2**

Code : 24BO4AP4A **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember and name the floral parts of different plant species	PSO - 1	K1
CO - 2	Identify and classify plants based on specific characters	PSO - 4	K2
CO - 3	Explain the purposes and applications of different layerage and graftage method	PSO - 5	K3
CO - 4	Analyze the plant physiology and interpret the mechanism	PSO - 2	K4
CO - 5	Evaluate the herbarium preparation of few medicinal plants and preserve plant specimens	PSO - 3	K5

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

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

Semester: IV				GENERAL BOTANY -II - LAB								Hours: 2
Code : 24BO4AP4A												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	2	2	2	5	2	2	3	2	2.73
CO - 2	4	5	2	2	3	3	4	2	2	5	3	3.18
CO - 3	2	3	2	3	5	5	2	2	3	3	5	3.18
CO - 4	4	2	5	3	2	2	4	5	3	2	2	3.09
CO - 5	2	3	2	5	3	3	2	2	5	3	3	3.00
Overall Mean Score												**3.04**

Result: The Score for this Course is **3.04** (High Relationship)

Note:

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

Values Scaling:

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

SECTIONING AND MOUNTING - The floral parts of

- Asclepiadaceae - *Calotropis gigantea*
- Euphorbiaceae - *Euphorbia heterophylla*

DEMONSTRATION OF PHYSIOLOGICAL SETUP

- Evolution of oxygen during photosynthesis
- Transpiration - Ganong's photometer experiment
- Light Screen Experiment

SPOTTERS

- Sorghum
- Black gram
- Pineapple
- Coffee
- Cotton
- Rubber
- Castor Seed

CHARTS

- Layerage
    1. Simple layering
    2. Compound layering
    3. Mound layering
    4. Trench layering
    5. Air layering
- Graftage
    1. Whip or Tongue grafting
    2. Top grafting or Crown grafting
    3. Cleft grafting

APPLIED BOTANY - LAB

Semester: IV **Hours: 2**

Code : 24BO4AP4B **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Remember the essential elements for building plant nursery	PSO - 1	K1
CO - 2	Understand the principles of nursery management and routine garden operations	PSO - 3	K2
CO - 3	Apply the knowledge of plant habitat to enhance horticultural crop production	PSO - 2	K3
CO - 4	Analyze the success and challenges of designing and maintaining various garden	PSO - 4	K4
CO - 5	Evaluate the knowledge to develop new and improved propagation techniques	PSO - 5	K5

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

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

Semester: IV				APPLIED BOTANY - LAB							Hours: 2
Code : 24BO4AP4B											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	2	2	5	2	3	3	2	2.91
CO - 2	2	4	2	5	3	3	2	2	5	4	3	3.18
CO - 3	4	2	5	3	3	3	4	5	3	2	3	3.36
CO - 4	2	5	2	4	3	3	2	2	4	5	3	3.18
CO - 5	3	2	4	3	5	5	3	4	3	2	5	3.55
Overall Mean Score												3.24

Result: The Score for this Course is **3.24** (High Relationship)

Note:

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

Values Scaling:

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

1. Tools, implements and containers used for propagation and nursery techniques.
2. Propagation by cutting and layering.
3. Identification and description of annuals, herbaceous perennials, climber, creepers, foliage and flowering shrubs, trees, palms, ferns, ornamental grasses, cacti and succulents.
4. Planning and designing of gardens.
5. Identification of commercially important flower crops and their varieties.
6. Visit the commercial nurseries and commercial tissue culture laboratory.

OFFICE FUNDAMENTALS #

Semester: IV **Hours: 3**

Code : 24SE4OA4C **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Bridge the fundamental concepts of computers with the present level knowledge of the students	PSO-2	K1
CO - 2	Clue up on the use of options in Word, and use of PowerPoint options to prepare pages and slide shows	PSO-3	K2
CO - 3	Develop the analytical mind for critical and logical thinking to apply mathematical foundations in Excel sheets	PSO-1	K3
CO - 4	Realize the need of computer word option to write dissertation, projects, thesis and blogs	PSO-5	K4
CO - 5	Appraise the use of Online Communication and Collaboration	PSO-4	K5

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

Semester: IV				**OFFICE FUNDAMENTALS #**							**Hours: 3**
Code : 24SE4OA4C											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of Cos**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO-1	3	4	2	5	2	4	3	5	2	2	4	3.27
CO-2	3	4	5	2	2	4	3	2	5	2	4	3.27
CO-3	5	3	2	2	4	3	5	2	2	4	3	3.18
CO-4	4	5	2	2	4	5	4	2	2	4	5	3.55
CO-5	4	4	2	2	5	4	4	2	2	5	4	3.45
Overall Mean Score												**3.35**

Result: The score for this course is **3.35** (High Relationship

Note:

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

Values Scaling:

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

UNIT I **9 Hours**

Starting MS - Word, Text creation and manipulation

Page setup (Applying page numbers, Header and Footer, Orientation, Drop cap)

UNIT II **9 Hours**

Starting MS- Power point and creating a new presentation

Applying layouts to slides, transition and animations to slides

UNIT III **9 Hours**

Creating Excel sheet for students' marks

Sorting and filtering the data

Applying the statistical functions: maximum, minimum, result

Applying the mathematical functions: total, average, round

Creating the charts: Columns, Line, Pie, Bar

UNIT IV **9 Hours**

E-Mail

Mail merge

UNIT V **9 Hours**

Blog

Social Media (Face book, X, Instagram)

Google meet

Google Drive

BOOKS FOR REFERENCE:

1. "Comdex 9-in-1 DTP Course Kit", Vikas Gupta, Dreamtech Press, 2011.
2. "Comdex 14- in -1 computer course Kit":\ Vikas Gupta, Dreamtech Press, 2011.
3. Sinha, P.K. & Sinha, Priti, *Computer Fundamentals*. BPB, 2020.

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STREAM C - OFFICE FUNDAMENTALS: 24SE4OA4C

Continuous Internal Assessment Component (CIA)

Passing Minimum: 40% out of 100

Component	Marks
Practical I	40
Practical II	40
Record	10
Assignment	5
Lab Activity	5
Total	**100**

Practical Question Pattern

Part - A

10 Questions × 1Mark =10 Marks

Part - B

2 Questions × 5 Marks = 10 Marks (Internal Choice from allotted Units)

Part - C

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

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

கல்வெட்டுக் கலை

பருவம்: நான்கு **நேரம்: 2**

குறியீடு: 24TA4GE02 **புள்ளி: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	கல்வெட்டுக்களில் வெளிப்படும் எழுத்துக்களை அறிவர்.	PSO-1	K1
CO - 2	தமிழ் மெய்கீர்த்திகளின் சிறப்பினை அறிவர்.	PSO-2	K2
CO - 3	கல்வெட்டுக்களைப் படியெடுக்கும் முறை குறித்து அறிவர்.	PSO-4	K3
CO- 4	பல்வேறு இடங்களில் காணப்படும் கல்வெட்டுக்களைக் குறித்த தகவல்களை அறிவர்.	PSO-5	K4
CO - 5	ஓலைச்சுவடிகள், செப்பேடுகள் பற்றிய தெளிவினைப் பெறுவர்.	PSO-3	K5

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

Semester: IV				கல்வெட்டுக் கலை							**Hours: 2**
Code : 24TA4GE02											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	5	3	2	3	3	5	3	3	4	2	3.36
CO - 2	4	3	3	2	5	5	3	5	3	4	2	3.55
CO - 3	5	4	3	2	3	3	4	3	3	5	2	3.36
CO- 4	2	3	3	5	4	4	3	4	3	2	5	3.45
CO - 5	4	4	5	2	3	3	4	3	5	4	2	3.55
Overall Mean Score												**3.45**

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

Note:

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

Values Scaling:

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

அலகு 1

தமிழ் எழுத்துக்கள் - தமிழி - வட்டெழுத்து - தமிழ் எழுத்து - கிரந்த எழுத்து - கல்வெட்டுக்களின் பொது அமைப்பு - மெய்க்கீர்த்திகள் (பக்.1-36) **6 Hours**

அலகு 2

கல்வெட்டுக்களின் காலக்கணக்கீடு -கல்வெட்டுக்களைப் படியெடுக்கும் முறை - படியெடுக்கப்பட்ட கல்வெட்டுக்களை நூலாக்கும் பணி - கல்வெட்டு வழிகாட்டிகள் - மாங்குளம் கல்வெட்டு - புகழூர் கல்வெட்டு - அறச்சலூர் கல்வெட்டு. (பக்.42-86) **6 Hours**

அலகு 3

நெகனூர்ப்பட்டி கல்வெட்டு - மடகலப் பொறிப்புகளில் தமிழி - பூலாங்குறிச்சிக் கல்வெட்டுகள் - வைகைக் கரைக் கல்வெட்டு - திருக்கோயிலூர் கபிலர் குன்று - புலிமான் கோம்பை, தாதப்பட்டி நடுகற்கள். (பக்.87-121) **6 Hours**

அலகு 4

ஜல்லிக்கட்டு வீரனுக்கு நடுகல் - நினைவுக் கற்கள் - நடுகற்கள் - சங்குகளில் எழுத்துப் பொறிப்புக்கள் - நீர்நிலைகளில் கல்வெட்டுக்கள். (பக்.127-150) **6 Hours**

அலகு 5

திருக்கோயில் திருப்பணிக் கல்வெட்டுக்கள் - உத்திரமேரூர் குடவோலைத் தேர்தல் கல்வெட்டு - பெருவழிகள் - ஓலைச்சுவடிகள் - செப்பேடுகள். (பக்.167-195) **6 Hours**

பாட நூல்

1. கல்வெட்டுக் கலை, - பொ.இராசேந்திரன், சொ. சாந்தலிங்கம், நியூ செஞ்சுரி புக் ஹவுஸ், (பி) லிட்., சென்னை 50, இரண்டாம் பதிப்பு - 2019.

பார்வை நூல்

1. கல்வெட்டியியல், - ஜே. தர்மராஜ், டென்சி பப்ளிகேஷன்ஸ், சென்னை.

DEPARTMENT OF ENGLISH
FUNCTIONAL ENGLISH

Semester: IV **Hours: 2**

Code : 24EL4GE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recognize grammatical structures and rules in written and spoken English	PSO-1	K1
CO - 2	Infer the usage of idioms	PSO-5	K2
CO - 3	Apply effective communication strategies in real-life situations.	PSO-3	K3
CO - 4	Analyse sentence structures to understand their syntactic and semantic functions.	PSO-4	K4
CO - 5	Assess the quality of written and spoken communication in terms of clarity, coherence and persuasiveness.	PSO-2	K5

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

Semester: IV						**FUNCTIONAL ENGLISH**					**Hours: 2**
Code : 24EL4GE02											**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	4	5	3	3	3	4	3.64
CO - 2	4	5	3	3	4	5	4	3	3	4	5	3.91
CO - 3	4	4	5	4	4	4	4	4	5	4	4	4.18
CO - 4	4	4	3	4	5	4	4	4	3	5	4	4.00
CO - 5	4	4	3	5	3	4	4	5	3	3	4	3.82
Overall Mean Score												**3.91**

Result: The score for this course is **3.91** (High relationship)

Note:

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

Values Scaling:

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

UNIT I **6 Hours**

Definition of Functional English

Significance of Functional English

Four Essentials of Functional English: LSRW

UNIT II **6 Hours**

Greeting, Introducing, Requesting, Suggestion

UNIT III **6 Hours**

Usage of fillers

American spelling

Spotting errors

UNIT IV **6 Hours**

Framing Sentences and questions

Phrasal verbs

Homophones

UNIT V **6 Hours**

Jumbled Sentences

Precis Writing

Idioms and their stories

COURSE BOOKS:

- Balan, Jayashree *Spoken English*. Vijay Nicole Imprints Private Limited, 2005.
- Upendran S. *Know Your English- Volume I*. Universities Press Private Limited, 2011.

BOOKS FOR REFERENCE:

1. Jane Straus, Lester Kaufman, and Tom Sterm, *The Blue Book of Grammar and Punctuation: An Easy-to-Use Guide with Clear Rules, Real-World Examples, and Reproducible Quizzes*, 2015.
2. Susan Thurman, *The Only Grammar Book You'll Ever Need: A One-Stop Source for Every Writing Assignment. 2011*
3. *Grant Barrett, Perfect English Grammar:* The Indispensable Guide to Excellent Writing and Speaking, 2013

WEB RESOURCES:

https://www.ieltsbuddy.com/idioms-practice.html

https://www.gutenberg.org/files/53680/53680-h/53680-h.htm

DEPARTMENT OF HISTORY

INDIAN POLITY

Semester: IV **Hours: 2**

Code : 24HY4GE02 **Credit: 2**

COURSE OUTCOMES

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Define the key components concepts and principles enshrined in the Indian Constitution, structure and functioning of the Union, State and Local Governments.	PSO-1	K1
CO-2	Classify the salient features of the Constitution, rights and responsibilities associated with being a citizen, roles and powers of the Heads of the Government at Union, State and Local level	PSO-2	K2
CO-3	Sketch the rights and responsibilities enshrined in the Constitution, the role of Parliament, the Supreme Court.	PSO-3	K3
CO-4	Analyze the structure and functions of the Government, the evolution of constitutional framework, delicate balance between individual liberties, societal welfare, and civic responsibilities.	PSO-4	K4
CO-5	Evaluate the sources of the Indian Constitution, executive, legislative, and judicial branches at the national and state level and the multi-tiered governance structure in India.	PSO-5	K5

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

Semester: IV				**INDIAN POLITY**							**Hours: 2**
Code : 24HY4GE02											**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	4	3	3	4	5	4	3	2	4	3.54
CO-2	4	2	5	3	3	4	4	5	3	2	4	3.54
CO-3	4	2	4	5	5	3	4	4	5	2	3	3.72
CO-4	4	5	4	3	3	2	4	4	3	5	2	3.54
CO-5	4	2	4	3	3	5	4	4	3	2	5	3.54
Overall Mean Score												**3.57**

Result: The score for this course is **3.57**(High relationship)

Note:

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

Values Scaling:

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

UNIT I

Preamble - Salient Features of the Constitution-Union, State and Union Territory

(6 Hours)

UNIT II

Fundamental Rights - Directive Principles of State Policies - Fundamental Duties.

(6 Hours)

UNIT III

Union Government: President - Prime Minister and Council of Ministers - Parliament -Supreme Court of India-Centre - State Relations

(6 Hours)

UNIT IV

State Government: Chief Minister - Governor - State Legislature - High Courts.

(6 Hours)

UNIT V

Political Parties and Political system in India - Local Government - Urban administration - Panchayat Raj. **(6 Hours)**

COURSE BOOK

- Dr.Floras Mary, P., Dr.Kasthuri, S., Dr.Tamil Selvi, M., Indian Administration, Pandiyanadu Cultural Foundation,Madurai,2022

BOOKS FOR REFERENCE

1. Agarwal R.C. and Mahesh Bhatnagar, *Constitutional Development and National Movement of India*, S. Chand & Co., New Delhi, 2006.
2. Dubey.S.N,Constitutions,Lakshminarayanan Agarwal,Agra,2011
3. Durga Das Basu, *Introduction to the Constitution of India*, Lexis Nexis, Gurgaon, 2019
4. Granville Austin, *The Indian Constitution: Cornerstone of a Nation,* Oxford University Press, New Delhi, 1999
5. Pylee, M.V. *Constitutional Government in India,* S. Chand & Co. Ltd., New Delhi, 2012

WEB RESOURCES

1. https://www.tn.gov.in/index.php
2. https://www.assembly.tn.gov.in/
3. https://legislative.gov.in/constitution-of-india
4. https://www.india.gov.in/
5. https://www.indianculture.gov.in/ebooks/indias-constitution-making

DEPARTMENT OF COMMERCE

PRINCIPLES OF ACCOUNTING

Semester: IV **Hours: 2**

Code : 24CO4GE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Understand the knowledge on basic concepts of accounting.	PSO-2	K1
CO - 2	Understand the different types of accounts.	PSO-3	K2
CO - 3	Make use of the different methods in preparing accounts.	PSO-5	K3
CO - 4	Analyse the types of accounting and its rules.	PSO-1	K4
CO - 5	Evaluate the adjustment of accounting.	PSO-4	K5

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

Semester: IV				**PRINCIPLES OF ACCOUNTING**							**Hours: 2**
Code : 23CO4GE02											**Credit: 2**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	4	5	3	4	3	4	4	5	3	3	4	3.82
CO - 2	3	2	2	4	5	4	3	2	5	2	4	3.27
CO - 3	4	3	4	5	2	5	4	3	2	4	5	3.73
CO - 4	5	3	4	2	3	2	5	3	3	4	2	3.27
CO - 5	2	4	5	4	3	4	2	4	3	5	4	3.64
Overall Mean Score												**3.55**

Result: The score for this course is **3.55** (High relationship)

Note:

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

Values Scaling:

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

UNIT I

Accounting- Definitions - Needs for Accounting-Objectives of Accounting - Double Entry System-Types of Accounting-Accounting Rules. **(6 Hours)**

UNIT II

Journal - Posting from Journal to Ledger-Balancing of Ledger Accounts. **(6 Hours)**

UNIT III

Final Accounts - Objectives - Preparation of Trading, Profit and Loss Account and Balance Sheet. **(6 Hours)**

UNIT IV

Trial Balance - Definition - Objectives - Preparation of Trail Balance. **(6 Hours)**

UNIT V

Preparations of Subsidiary Books - Simple Cash Book - Petty Cash. **(6 Hours)**

COURSE BOOK:

- Course Material prepared by the Department of Commerce.

BOOKS FOR REFERENCE:

1. T.S. Reddy & Dr. A. Murutthy, Advanced Accountancy, Margham Publications, Chennai, 2016.
2. R.S.N. Pillai & Bagavathi, Advanced Accounting, S. Chand & Company Ltd, New Delhi, 2009.
3. R.L. Gupta & M. Radhaswamy, Advanced Accounting, Sultan Chand & Sons, New Delhi, 2005.
4. Dr. M.A. Arulandam, Dr. K.S. Raman, Advanced Accounting, Himalaya Publishing House, New Delhi, 2009.

WEB RESOURCES:

1. https://www.slideshare.net/ramusakha/basics-of-financial-accounting
2. https://www.accountingtools.com/articles/what-is-a-single-entry-system.html
3. https://accountingseekho.com/

DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATION

ADVERTISING AND SALESMANSHIP

Semester: IV **Hours: 2**

Code : 24CC4GE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Explain about advertising functions classification and social economy and ethical issues.	PSO - 1	KI
CO-2	Demonstrate the advertising process buying behavior, advertising plan and advertising copy.	PSO - 2	K2
CO-3	Discuss the advertising media selection decision and evaluating advertising effectiveness.	PSO -5	K3
CO-4	Estimate a brief knowledge about sales promotion importance methods and effectively selling.	PSO - 3	K4
CO-5	Outline the importance of salesmanship, recruitment, motivation and rewarding of sales personal.	PSO - 4	K5

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

Semester: IV							**ADVERTISING AND SALESMANSHIP**					**Hours: 2**
Code : 24CC4GE02												**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	4	3	3	3.73
CO-2	3	4	5	3	5	3	3	5	4	3	3	3.73
CO-3	4	3	4	5	4	3	4	4	3	3	5	3.82
CO-4	3	5	4	3	4	3	3	4	5	3	3	3.64
CO-5	4	3	4	3	4	5	3	4	3	5	3	3.73
Overall Mean Score												**3.73**

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

Note:

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

Values Scaling:

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

UNIT I

Meaning of advertising - Characteristic Features of Advertising - Nature and Scope of Advertising - Benefits or Advantages of Advertising - Criticisms of Advertising - Is Advertising Economic Waste - Difference between Advertising and Salesmanship. **(6 Hours)**

UNIT II

Advertising Media - Indoor and Outdoor Advertising - Advertising agency - Role - Importance. **(6 Hours)**

UNIT III

Personal Selling - Definition - Salesmanship - Definition Features - Objectives - Benefits - Criticisms salesmanship. **(6 Hours)**

UNIT IV

Qualities of a successful salesman: Physical, Mental, Social and Moral Qualities - Other requisites of a Salesman. **(6 Hours)**

UNIT V

Recruitment of Salesman - Sources - Remuneration of Salesman - Methods.

(6 Hours)

COURSE BOOK:

- P. Saravanavel & S. Sumathi, Advertising and Salesmanship, Meenakshi Publications, Chennai, 2020.

BOOKS FOR REFERENCE:

1. Daver, ‘‘Salesmanship Advertising’’, Progressive Publishers, Mumbai, 1980.
2. Mahendra Mohan, ‘‘Advertising Management’’, Mc-Graw Hill Publishing, New Delhi, 1996.
3. R.S.N. Pillai & Bagavathi, ‘‘Salesmanship’’, Sultan Chand Co Ltd, New Delhi, 2009.

DEPARTMENT OF BUSINESS ADMINISTRATION

TALLY - Lab #

Semester: IV **Hours: 2**

Code : 24BB4GE02 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO-1	Gain knowledge in ERP- 9 Accounting Principles and Concepts, Groups & Ledgers, Voucher Entries, Advance Inventory & Taxes in Tally, Payroll.	PSO-1	K1
CO-2	Summarize Accounting Principles, Types of Vouchers, Order processing.	PSO-5	K2
CO-3	Use Accounting Rules and maintain Bill Wise Details.	PSO-3	K3
CO-4	Revise Setting up of Company in Tally ERP 9, Bank Reconciliation, and Report Generations.	PSO-2	K4
CO-5	Defend Units of Measure, TDS Returns Filing and Short Keys in Tally. ERP 9	PSO-4	K5

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

Semester: IV							**TALLY - Lab #**					**Hours: 2**
Code : 24BB4GE02												**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	4	3	5	3	5	3	3	4	3	3.73
CO-2	3	3	3	3	3	5	3	3	3	3	5	3.36
CO-3	3	3	3	5	3	3	3	3	5	3	3	3.36
CO-4	3	5	3	4	3	4	3	5	4	3	4	3.73
CO-5	3	3	5	3	3	3	3	3	3	5	3	3.36
Overall Mean Score												**3.51**

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

Note:

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

Values Scaling:

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

UNIT I

Basic of Accounting & Fundamentals of Tally. ERP 9: Accounting Principles or Concepts, Rules for Accounting, Creation/ Setting up of Company in Tally ERP 9 and Configuration. **(6 Hours)**

UNIT II

Accounting Master in Tally. ERP 9: Groups & Ledgers Creation Inventory Master in Tally. ERP 9: Creation of Stock Groups and Categories and Units of Measure.

(6 Hours)

UNIT III

Voucher Entries & Advance Accounting in Tally. ERP 9: Types of Vouchers, Invoicing, Bill Wise Details, Cost Centers and Bank Reconciliation and Scenarios Management. **(6 Hours)**

UNIT IV

Advance Inventory & Taxes in Tally. ERP 9: Order processing, Batch Wise Details, POS, TDS, TDS Returns Filing, TCS, GST Returns, EPF, ESIC & Professional Tax.

(6 Hours)

UNIT V

Technological Advantages, Payroll, Report Generations, Short Keys in Tally. ERP 9

(6 Hours)

COURSE BOOK:

- S. Palanivel, Tally Accounting Software, Margham Publications, 2019

BOOKS FOR REFERENCE:

1. Shraddha Singh & Navneet Mehra, Tally. ERP 9, V & S Publishers, 2015
2. Official Guide to Financial Accounting using Tally. ERP 9, Fourth Revised & Updated Edition, BPB Publications, 2020
3. Vinod Kumar, Tally. ERP 9 Made Easy, Accounting Education, 2019.
4. Bimlendu Shekhar, Tally Practical Work Book -1, 2nd Edition. 2018.
5. Asian's Quintessential Course Tally, ERP 9 with GST by Vishnu Priya Singh edition 2020.

WEB RESOURCES

1. https://tallysolutions.com/learning-hub/
2. https://www.tutorialkart.com/tally/tally-tutorial/
3. https://sscstudy.com/tally-erp-9-book-pdf-free-download/
4. https://tallysolutions.com/tally/how-to-use-gst-in-tally-erp-9/
5. https://www.javatpoint.com/tally

ABILITY ENHANCEMENT COURSE-4 (AEC-4)

CAPACITY BUILDING #

Semester: IV **Hours: 1**

Code : 24AE4CB04 **Credit: 1**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the importance of capacity building	PSO-1	K1
CO - 2	Develop skills for life-long learning	PSO-2,4	K2
CO - 3	Asses the importance of organizational development	PSO-3	K3
CO - 4	Analyze the need of the community togetherness	PSO-4	K4
CO - 5	Evaluate tech-based learning experiences.	PSO-5	K5

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

Semester: IV			**CAPACITY BUILDING #**								**Hours: 1**
Code : 24AE4CB04											**Credit: 1**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of COs**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO -1	3	5	3	3	3	3	3	4	5	3	4	3.54
CO - 2	4	5	4	3	3	4	3	4	4	3	5	3.81
CO - 3	4	4	3	3	5	4	3	4	3	3	5	3.72
CO - 4	3	4	3	4	3	4	3	3	5	3	5	3.63
CO - 5	4	4	3	3	4	4	3	4	5	4	5	3.90
Overall Mean Score												**3.72**

Result: score for this course is **3.72** (High Relationship)

Note:

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

Values Scaling:

Mean Score of COs = 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 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**

BIOCHEMISTRY

Semester: V **Hours: 5**

Code : 24ZB5MC08 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the basic principles of biochemistry, and structure of biomolecules	PSO - 1	K1
CO - 2	Explain the biochemical processes occurring in living organisms.	PSO - 2	K2
CO - 3	Apply biochemical concepts to solve problems in areas such as metabolism and molecular biology.	PSO - 3	K3
CO - 4	Analyze biochemical processes and its implications.	PSO - 4	K4
CO - 5	Critically assess the significance of micro and macronutrients for a healthy life.	PSO - 5	K5

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

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

Semester: V			**BIOCHEMISTRY**						**Hours: 5**			
Code : 24ZB5MC08												**Credit: 4**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	3	3	3	5	4	3	3	3	3.55
CO - 2	4	4	5	3	3	3	4	5	3	4	3	3.73
CO - 3	3	3	4	5	3	3	3	4	5	3	3	3.55
CO - 4	3	5	4	4	4	4	3	4	4	5	4	4.00
CO - 5	3	3	3	3	5	5	3	3	3	3	5	3.55
Overall Mean Score												**3.68**

Result: The Score for this Course is **3.68** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Atoms and buffers: Atom - structure, chemical bonds - ionic bond, covalent bond, hydrogen bond. pH, Bronsted - Lowry concept of acids and bases, titration curve of acid and base, buffers, mechanism of buffer action, Henderson - Hasselbalch equation, acidosis and alkalosis, oxidation and reduction and isomerism.

(15 Hours)

UNIT II

Carbohydrates: Structure and classification of Monosaccharides, Disaccharides and Polysaccharides (with two examples each). Biological significance of carbohydrates. Glycolysis, Kreb's cycle, Glycogenolysis, Gluconeogenesis and HMP Shunt, Blood sugar level - Glycosuria, Diabetes mellitus. **(15 Hours)**

UNIT III

Protein: Amino acids - structure and classification. Chemical bonds involved in protein structure, structure of protein - Lindstrom - Lang's structure of protein, properties and biological significance of proteins. Metabolism - Deamination, Transamination, Decarboxylation, Transmethylation of amino acids, Urea cycle.

(15 Hours)

UNIT IV

Lipids: Fatty acids - saturated fatty acids and unsaturated fatty acids. Lipid - structure and classification - simple, compound lipid - phospholipids (lecithin and cephalin), Glycolipids (sulfolipids) and derived lipids - steroids (cholesterol). Biological significance of lipids. Metabolism - Beta Oxidation of fat. Formation of ketone bodies. **(15 Hours)**

UNIT V

Enzymes and vitamins: Enzymes - properties, classification, mechanism of enzyme action, factors affecting enzyme activity, biological significance of enzymes, enzyme inhibition, co-enzymes and isozymes. Vitamins - sources and functions of water soluble and fat-soluble vitamins. **(15 Hours)**

COURSE BOOK:

1. Ambika Shanmugam, Fundamentals of Biochemistry for Medical Students 7th edition. Published by Wolters Kluwer, India, 2012.

.

UNIT	BOOK	CHAPTER
I	1	14, 16
II	1	1, 17
III	1	3, 21
IV	1	2,19
V	1	4, 5

BOOKS FOR REFERENCE:

1. Jain, J.L., Sunjay Jain and Nitin Jain. Fundamentals of Biochemistry. S. Chand & Co. Ltd., New Delhi, 2014.
2. Gupta, S. N, Biochemistry. Rastogi Publications, Meerut, 2011.
3. Vasudevan, D. M., Sree Kumari, S. & Kannan Vaidyanathan. Text Book of Biochemistry for Medical Students 7th edition. Jaypee Brothers Medical Publishers Pvt. Limited, New Delhi, 2013.
4. Chatterjee, M.N. and Rana Shinde, Text Book of Medical Biochemistry 8th edition. Jaypee Brothers Medical Publishers Pvt. Limited, New Delhi, 2012.
5. Jeremy M. Berg, John L. Tymoczko & Lubert Stryer. Biochemistry 6th edition. Freeman & Co. Publishers, San Francisco, 2006.
6. Rodney F Boyer, Modern Experimental Biochemistry 3rd edition. Published by Darling Kindersley (India), Pvt., Ltd, South Asia, 2009.
7. David.L.Nelson and Michael.M.Cox. Lehninger's Principles of Biochemistry 4th edition. W.H. Freeman and CO., New York, 2008.
8. Lehninger, A. L., Nelson, D. K., and Cox, M. M. Principles of Biochemistry. CBS Publishers and distributors, New Delhi, 1993.
9. Stryer, L. Biochemistry. W. H. Freeman and Company, New York, 1988.

MICROBIOLOGY

Semester: V **Hours: 6**

Code : 24ZB5MC09 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the fundamental principles of Microbiology	PSO1	K1
CO - 2	Summarize the classification of microorganisms and their role in industrial applications	PSO 4	K2
CO - 3	Demonstrate the structural and functional organization of microorganisms and their significance in microbial process	PSO 3	K3
CO - 4	Analyze the life cycle of various microbes and the techniques employed for their cultivation	PSO 2	K4
CO - 5	Assess the diseases caused by microorganisms and explore the applications of microbes in healthcare and agriculture	PSO 5	K5

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

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

Semester: V							**MICROBIOLOGY**					**Hours: 6**
Code : 24ZB5MC09												**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	2	4	3	3	3	5	4	3	2	3	3.36
CO - 2	4	5	3	2	4	4	4	3	2	5	4	3.64
CO - 3	3	3	4	5	4	4	3	4	5	3	4	3.82
CO - 4	2	3	5	2	4	4	2	5	2	3	4	3.27
CO - 5	3	4	4	3	5	5	3	4	3	4	5	3.91
Overall Mean Score												**3.6**

Result: The Score for this Course is **3.6 (**High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 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 Microbiology: History of Microbiology, Scope, contributions of Louis Pasteur and Robert Koch. Classification of microbes - Whittaker's five kingdom concepts. Basic techniques in Microbiology: sterilization and disinfection - dry heat, moist heat, filtration, incineration, radiation and chemical. Culture of microbes - culture medium, culture techniques - batch, fed-batch, continuous culture, serial dilutions, spread plate, pour plate and streak plate. Staining techniques - simple, Gram and acid fast. **(18 Hours)**

UNIT II

Bacteria: Classification, size, shape, arrangement, ultra-structure of bacterial cell, bacterial reproduction- Conjugation - Recombination, Bacterial growth - phases of growth and growth curve, factors influencing bacterial growth. Bacterial diseases - Pneumonia, Typhoid Fever, Cholera **(18 Hours)**

UNIT III

Viruses: General properties of Viruses, Classification, Structure of Virus - Adenovirus, Tobacco Mosaic Virus, Influenza Virus, HIV and Bacteriophages, Differences between Bacteria and Virus, Viroids and Prions. Life cycle of phages, Viral Replication - Lytic and Lysogenic, Viral Diseases - Covid 19, Chikungunya, Dengue fever. **(18 Hours)**

UNIT IV

Algae and Fungi: General characteristics of Algae, Classification, Organization of thallus, Pigmentation and Reproduction - Types, Economic importance of algae. Fungi - Outline classification of fungi, Ultrastructure and cell wall composition, Morphology of some common fungi - Mucor, Rhizopus, Aspergillus, Penicillium and Fusarium, Economic importance of Fungi. **(18 Hours)**

UNIT V

Microbial Technology: Fermentation - Definition, Types, Fermenter - Types of Fermenters, Production of Microbial Products: Antibiotics - Penicillin, Streptomycin, Organic acids - Citric Acid and Acetic Acid, Vitamin B12, Single Cell Protein (SCP), Agricultural Products - Biofertilizers and Biopesticides. Virus as Biocontrol agents, Bioremediation - types, Biodegradation - role of superbug in degrading oil pollution **(18 Hours)**

COURSE BOOKS:

1. Balakrishna M.Sandikar, Fundamental Microbiology, Ruba Sen Publishers, Kolkatta, 2021

UNIT	BOOK	CHAPTER
I	1	1, 10, 11
II	1	3, 6, 9
III	1	5
IV	1	4
V	1	13, 16

BOOKS FOR REFERENCE

1. Dubey R.C., Maheshwari D.K., A Text Book of Microbiology Revised Edition, S. Chand and Company, New Delhi, 2013.
2. Michael J, Pelczar Jr, E.C.S. Chan, and Noel R. Kreig, Microbiology, Fifth Edition, McGraw Hill (India) Private Limited, New Delhi, 1958.
3. Balkrishna M. Sandikar, Fundamental Microbiology, Ruba Sen Books Allied Ltd. Kolkata, 2021.

IMMUNOLOGY

Semester: V **Hours: 6**

Code : 24ZB5MC10 **Credit: 5**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the history and key principles of Immunology.	PSO -1	K1
CO - 2	Understand the different types and properties of the immune cells and immune components.	PSO - 2	K2
CO - 3	Illustrate the mechanism of immune response against broad spectrum of pathogens and diseases.	PSO - 5	K3
CO - 4	Analyse the underlying functions of immune system.	PSO - 3	K4
CO - 5	Summarize the process, methods and techniques in Immunology.	PSO - 4	K5

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

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

Semester: V				**IMMUNOLOGY**								**Hours: 6**
Code : 24ZB5MC10												**Credit: 5**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	2	3	4	5	6	1	2	3	4	5	
CO - 1	5	2	4	4	3	3	5	4	4	2	3	3.55
CO - 2	4	2	5	4	3	3	4	5	4	2	3	3.55
CO - 3	3	2	4	4	5	5	3	4	4	2	5	3.73
CO - 4	3	2	3	5	4	4	3	3	5	2	4	3.45
CO - 5	2	5	3	4	4	4	2	3	4	5	4	3.64
Overall Mean Score												**3.58**

Result: The Score for this Course is **3.58** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

History and fundamentals of Immunology: History and scope of immunology, contributions of Edward Jenner and Louis Pasteur. Types of immunity: innate - physical, mechanical, biochemical, cellular factors, genetic factors and acquired - passive and active, natural and artificial immunity. Immune response: Humoral - primary and secondary immune responses, immunological memory and Cell mediated immune response. **(18 Hours)**

UNIT II

Organs and cells of the immune system: Primary lymphoid organs - thymus, bursa of Fabricius, bone marrow and secondary lymphoid organs - lymph node, spleen, MALT, Payer's patches and tonsils. Haematopoiesis - Fate of stem cells, lymphoid lineage - T cell and its types, B cell and its types and Null cell and its type. Myeloid lineage - eosinophils, basophils, neutrophls, mast cells, platelets, monocytes and macrophages. **(18 Hours)**

UNIT III

Immunochemistry and Immunotechnology: Antigen properties, epitopes, haptens, adjuvants, immunogenicity and antigenicity. Antibodies - structure, types, properties and functions. Antigen antibody interaction - properties, Detection of Ag - Ab reaction - precipitation and agglutination. Immunofluorescence, ELISA and Western blotting. **(18 Hours)**

UNIT IV

Molecular Immunology: Complement- properties, classical and alternative pathways. Major Histocompatibility Complex (MHC) - structure and functions of MHC, MHC antigens, HLA and H_2. Hypersensitivity - Type I, II, III and IV. Cytokines - properties and functions. **(18 Hours)**

UNIT V

Clinical Immunology: Transplantation Immunology - classification of grafts, immunology of graft rejection, clinical transplantation - cornea, kidney, heart, liver, bonemarrow transplant and immune suppression. Tumour immunology - tumour antigen and immune response to tumour, immune therapy. Autoimmune disorders - characteristics, types - Myasthenia gravis, Lupus erythematosis and Hashimoto's thyroiditis. Vaccines - types of vaccines - attenuated vaccines, recombinant vector vaccines and vaccination schedule. Immuno deficiency diseases - overview. **(18 Hours)**

COURSE BOOKS:

1. Rao C.V, Immunology, Narosa Publishing House, New Delhi, India, 2006.
2. Fathimunisha Begum, Immunology. PHI Learning Private Limited, New Delhi, 2014.

UNIT	BOOK	CHAPTER
I	1	2, 3
	2	1, 14, 15
II	1	4
	2	2, 3
III	1	8
	2	3, 4, 6, 29
IV	1	15, 16, 19
	2	8, 9, 10, 17
V	1	17, 18, 20, 22, 23, 24,
	2	19, 20, 21, 27, 28

BOOKS FOR REFERENCE:

1. Rabindra Narain, Clinical Immunology, Wisdom press, New Delhi, India, 2012.
2. Roitt J.M, Essential Immunology, Blackwell Scientific Oxford, 1984.
3. Kuby.T J. Kindt, R. A. Goldsby, B. A. Osborne, Immunology, 6th edition, W. H. Freeman and Company, New Delhi, 2007.
4. Kannan I, Immunology, MJP Publishers, Chennai, 2007.
5. Seemi Farhat Basir, Text book of Immunology, PHI Learning Private Limited, New Delhi, 2012.
6. Khan FH The Elements of Immunology. First edn, Pearson Education, New Delhi, 2009.
7. Coico R and Sunshine G. Immunology: A short course, Sixth edn, Wiley Blackwell, New York, 2009.
8. Murphy K. and Weaver C. Janeway's Immunobiology (9th edition). Garland Science, New York and London,2017
9. Tizard I.R. Immunology - An Introduction, 4th ed., UK, Saunders College Publishing,2007
10. Ashim, K., Chakravarthy, Immunology and Immunotechnology (2th ed.). Delhi: Saurabh Printers Pvt. Ltd.2007

BIOCHEMISTRY, MICROBIOLOGY AND IMMUNOLOGY - LAB

Semester: V **Hours: 5**

Code : 24ZB5CP04 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Acquire comprehensive knowledge on the methodology for qualitative analysis of biomolecules.	PSO - 1	K1
CO - 2	Understand the culture methods, growth and staining of microbial organisms	PSO - 3	K2
CO - 3	Demonstrate the immunological techniques including Immunoelectrophoresis, Hemagglutination and Immunodiffusion	PSO - 2	K3
CO - 4	Infer knowledge on lymphoid organs and bio instruments.	PSO - 4	K4
CO - 5	Evaluate the various biochemical assays and to assess the microbial morphology	PSO - 5	K5

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

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

Semester: V			**BIOCHEMISTRY, MICROBIOLOGY AND IMMUNOLOGY - LAB**						**Hours: 5**
Code : 24ZB5CP04									**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	4	4	3	3	5	4	4	3	3	3.73
CO - 2	4	2	3	5	4	4	4	3	5	2	4	3.64
CO - 3	3	2	5	4	3	3	3	5	4	2	3	3.36
CO - 4	4	5	3	4	2	2	4	3	4	5	2	3.45
CO - 5	3	2	2	2	5	5	3	2	2	2	5	3.00
												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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

BIOCHEMISTRY

1. Qualitative analysis of Carbohydrate- Benedict's test, Fehling's test, Methylene blue test.
2. Qualitative analysis of Protein - Biuret test, Millon's test, Ninhydrin test.
3. Qualitative analysis of lipid - Emulsification test, Sudan III test, Formation of acrolein test.
4. Separation of amino acids by Paper Chromatography.
5. Instruments:
    a. Colorimeter
    b. pH Meter
    c. Centrifuge
    d. Chromatogram
    e. Electrophoresis

MICROBIOLOGY

1. Preparation of culture media for microbes
    a. Broth media, Agar media, Slant
2. Pure culture of bacteria
    a. Serial dilution b. Pour plate c. Spread plate technique
3. Staining of bacteria - Simple and Gram stain.
4. Study of microbial population - Methylene blue reduction test.
5. Spotters
    a. Laminar Air flow
    b. Autoclave
    c. Hot air oven
    d. Colony counter.

IMMUNOLOGY

1. Dissection of Lymphoid organs in chick.
2. Histology of lymphoid organs (Slides/Charts).
    - Primary lymphoid organs - Thymus, Bone marrow.
    - Secondary lymphoid organs - Lymph nodes, spleen.
3. Preparation of antigen - BSA, bacterial, SRBC.
4. Production of antiserum.
5. Separation of lymphocytes from peripheral blood.
6. Immunoelectrophoresis - Demonstration.
7. Haemagglutination - Demonstration

DSE - 1 - BIOSTATISTICS AND RESEARCH METHODOLOGY

Semester: V **Hours: 4**

Code : 24ZB5DE1A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	State the key concepts of biostatistics and principles of research and bio instruments.	PSO - 1	K1
CO - 2	Identify the types of data, find suitable statistical methods for analysis and understand the operation of laboratory equipments.	PSO - 2	K2
CO - 3	Develop the ability to organize and analyze data effectively and apply the appropriate research tools and instruments.	PSO - 3	K3
CO - 4	Analyze the biological samples and interpret the statistical results and appraise the research methods suitable for research.	PSO - 4	K4
CO - 5	Assess the various measures of statistics to analyze the biological data and design experiments, project works obtained using different research tools.	PSO - 5	K5

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

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

Semester: V				DSE - 1 - BIOSTATISTICS AND RESEARCH METHODOLOGY								Hours:4
Code : 24ZB5DE1A												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	4	3	2	2	5	4	3	2	2	3.09
CO - 2	4	2	5	3	2	2	4	5	3	2	2	3.09
CO - 3	2	4	3	5	4	4	2	3	5	4	4	3.64
CO - 4	2	5	3	4	4	4	2	3	4	5	4	3.64
CO - 5	2	4	3	4	5	5	2	3	4	4	5	3.73
Overall Mean Score												**3.44**

Result: The Score for this Course is **3.44** (High Relationship)

Note:

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

Values Scaling:

Mean Score of COs = 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 Biostatistics: Population, data, samples and variables. Sampling methods - random and non- random sampling. Collection - primary and secondary data. Classification and presentation of data - tables, graphs, diagrams. **(12 Hours)**

UNIT II

Measures of central tendency and dispersion: Mean, median and mode for grouped and ungrouped data. Measures of dispersion - calculation of range, mean deviation, quartile deviation, standard deviation, standard error, variance and coefficient of variation (problems to be included). **(12 Hours)**

UNIT III

Probability: Basic terms in probability, types - apriori and aposteriori, theorems - Addition and Multiplication, Binomial and normal distribution. Skewness and Kurtosis - definition and types. Hypothesis testing - Null hypothesis and alternative hypothesis, degrees of freedom, significance levels, parametric tests -paired and unpaired t-test, and non-parametric tests - Chi-square test (problems to be included in binomial distribution, Chi-sqaure test and t-test). **(12 Hours)**

UNIT IV

Basic principles and types of research: Literature collection - need for review of literature, review process and bibliography, Different system of siting reference - name year system and alphabet number system, Plagiarism, Writing a research report - dissertation, Research engines - Google Scholar, Web of Science and Scopus. **(12 Hours)**

UNIT V

Instrumentation and methods: Microscopy - Light, Phase contrast, Cytological techniques - fixation and sectioning, staining - mechanism of staining and vital staining. Measurement of pH - pH paper, pH meter. Principle, instrumentation and applications of Rotary Vacuum Evaporator, Micrometer, Colorimeter, Spectrophotometer, Ultra-centrifuge, Chromatography (paper) and Electrophoresis (paper). **(12 Hours)**

COURSE BOOKS:

1. Pranab Kumar Banerjee, Introduction to Biostatistics, IV edition, S.Chand and Company Pvt Ltd, 2004
2. Gupta S.P. Statistical Methods. 40th edition, S.S. Chand Publishers, 2014
3. Gurumani, N, Research Methodology for Biological Sciences, MJP Publishers, Chennai, 2017

UNIT	BOOK	CHAPTERS
I	1 2	3 3, 4
II	1 2	4, 5 7, 8
III	1 2	7, 8, 9 9
IV	3	1, 2, 3, 4, 5, 6, 7
V	3	9, 10, 11, 12, 13, 14, 17

BOOKS FOR REFERENCE:

1. Daniel W.W. Biostatistics. 9th edition, John Wiley and Sons, New York, 2009
2. Kothari C.R. Research Methodology. 2nd edition, New Age International Publishers, New Delhi, 2004
3. Palanichamy, Statistical Methods for Biologist. Palani Paramount Publications, 2002
4. Veerakumari, L, Bioinstrumentation, MJP Publishers, Chennai, 2005
5. Marimuthu, R, Microscopy and Micro techniques, MJP Publisher, Chennai, 2008
6. Ana, S.V.S. Biotechniques. Rastogi Publications, Meerut, 2002
7. Keith Wilson & John Walker, Principles and Techniques of Practical Biochemistry 5th Edition, Cambridge University Press, United Kingdom, 2000
8. Robert L. Dryer & Gene F.Lata, (1989), Experimental Biochemistry, Oxford University Press, New York.

DSE - 1 - HUMAN REPRODUCTIVE BIOLOGY

Semester: V **Hours: 4**
Code : 24ZB5DE1B **Credit: 3**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the structure and functions of male and female reproductive system, reproductive diseases and technology.	PSO -1	K1
CO - 2	Describe the process of reproduction, reproductive disorders and ART.	PSO - 2	K2
CO - 3	Relate the knowledge of human reproductive health to human welfare.	PSO - 5	K3
CO - 4	Compare male and female reproductive system and reproductive mechanisms.	PSO - 4	K4
CO - 5	Appraise the modern techniques of reproduction and reproductive anomalies.	PSO - 3	K5

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

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

Semester: V			**DSE - 1 - HUMAN REPRODUCTIVE BIOLOGY**								**Hours: 4**
Code : 24ZB5DE1B											**Credit: 3**
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	3	4	3	3	5	3	4	3	3	3.55
CO - 2	3	3	5	4	3	3	3	5	4	3	3	3.55
CO - 3	3	4	3	4	5	5	3	3	4	4	5	3.91
CO - 4	3	5	3	3	4	4	3	3	3	5	4	3.64
CO - 5	3	3	3	5	4	4	3	3	5	3	4	3.64
Overall Mean Score												**3.66**

Result: The score for this course is **3.66** (High relationship)

Note:

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

Values Scaling:

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

UNIT I

Male reproductive system: Origin and migration of primordial germ cells, functional morphology and anatomy of male reproductive system- epididymis, vas deferens, seminal vesicles, ventral prostate, bulbourethral gland and preputial gland, physiology of male gametogenesis, fertility of individual, ultra-structure of spermatozoa, sperm maturation, hormonal control of male reproductive system, biochemistry of semen and capacitation. **(12 Hours)**

UNIT II

Female reproductive system: Structure and function of female reproductive system, puberty, formation of ova, physiology of ovulation, menstrual cycle, nutrition and stress influences on the ovulatory cycle, hormonal control of female reproductive system, effects of sexual hormones on maternal-infant bonding, stress, anorexia and effects of steroids. **(12 Hours)**

UNIT III

Fertilization, foetal development and senescence: Process of fertilization, implantation and formation of the foetus and placenta, pregnancy, foetal development, labour and birth, lactation and neonatal life, reproductive aging and menopause. **(12 Hours)**

UNIT IV

Reproductive Health: Male reproductive diseases - sexual dysfunctions, Phimosis, Testicular Torsion, male infertility, erectile dysfunction, vasectomy, blood in semen. Female reproductive diseases- endometriosis, fibroids, endometritis, chronic infection of uterus, congenital uterine anomalies, ovarian cysts, Poly Cystic Ovary Syndrome (PCOS), HIV/AIDS and pelvic varicosities, cancers of the reproductive system, adenomyosis, gland like growth in myometrium. Sexually transmitted diseases- syphilis, gonorrhea and chlamydia. **(12 Hours)**

UNIT V

Reproductive Technology: Birth control measures, Intrauterine devices (IUD), Assisted Reproduction Technologies - IVF, ET, GIFT, ZIFT, FET, ICSI, IUI, surrogacy, ethical, legal and social impact of modern Assisted Reproductive Technologies.

(12 Hours)

COURSE BOOKS:

1. Mohan P Arora, Animal Physiology, Himalaya Publishing House, Mumbai, 2015

UNIT	BOOK	CHAPTERS
I	1	20
II	1	20
III	1	20
IV	1	20
V	1	20

BOOKS FOR REFERENCE:

1. Barrington E.J.W, An introduction to general and comparative endocrinology, Oxford University press, London, 1976.
2. Moudgal N.R, K. Yoshinaga, A. J. Rao, P. R. Adiga, Perspectives in primate reproductive biology, Wiley Eastern Ltd., New Delhi, Bangalore, 1991.
3. Knobil E, and Neil J. D, The physiology of reproduction, Vol. I & II. Raven press, New York, 1994.
4. Raghavendra Puri, Mammalian endocrinology, Vol. I & II, Dominant Publishers and Distributors, New Delhi, 2003.
5. Muneeth Kainth, Chordate Embryology, Dominant Publishers and Distributors, New Delhi, 2005.
6. Paul Wassar man and D. Jimmy., Neill Knogbil and Neill's Physiology of reproduction, volume 1st and 2nd and 3rd edition, 2005.
7. Thomas W.S, Langman's Medical Embryology, 13th edition Lippincott, Williams and Wilkins, Baltimore, 2014.
8. Gary B.B Steven, R.B. Philip, H.F. Philippa, Larsen's Human Embryology 5th edition, Elsevier, 2014.

DSE - 1 - AQUATIC ZOOLOGY

Semester: V **Hours: 4**

Code : 24ZB5DE1C **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the history of marine biology, estuarine biology, limnology and aquatic pollution.	PSO -1	K1
CO - 2	Understand the characteristics of aquatic ecosystem, adaptations of aquatic organisms and aquatic sustainability.	PSO - 2	K2
CO - 3	Measure the components of aquatic ecosystem and relate the physiology of aquatic organisms to conserve aquatic habitats.	PSO - 3	K3
CO - 4	Analyze the attributes of marine, fresh water and estuarine ecosystem, relationship of aquatic organisms with their environment and impact of aquatic pollution.	PSO - 4	K4
CO - 5	Compare the various types of aquatic ecosystem and life of aquatic organisms and predict the measures to control aquatic pollutions.	PSO -5	K5

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

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

Semester: V				**DSE - 1 - AQUATIC ZOOLOGY**							**Hours: 4**
Code : 24ZB5DE1C											**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	4	3	3.55
CO - 2	3	4	5	3	3	3	3	5	3	4	3	3.55
CO - 3	3	4	3	5	3	3	3	3	5	4	3	3.55
CO - 4	3	5	4	3	4	4	3	4	3	5	4	3.82
CO - 5	3	3	3	3	5	5	3	3	3	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

Overview of aquatic ecosystem: Introduction to Marine Biology, Oceanography, Estuarine Biology and Limnology. Water and water cycle. History and significance of Marine Biology and Limnology. Human cultural relations with water. Properties of water - water as a solvent and temperature stabilizer. Physical and chemical properties of water and seawater. **(12 Hours)**

UNIT II

Freshwater ecosystem: Characteristics of pond, lake, wetland, stream and river. Abiotic factors of fresh water - Light, temperature, thermal stratification, dissolved solids, carbonate, bicarbonates, phosphates, nitrates, turbidity, dissolved gases - oxygen and carbon dioxide. Origin and classification of lakes and streams - different stages of stream development. **Biotic factors:** components, producers, consumers, decomposers, transformers, productions rates, energy flow structure and ecological pyramids. Biological communities of lakes and rivers - Phytoplankton, periphyton, zooplankton, benthos, microphytes, insects, Mollusca, Amphibians, fish and birds. Benthic communities and detritus. Organic carbon cycling and ecosystem metabolism. **(12 Hours)**

UNIT III

Marine ecosystem: Characteristics of estuarine, intertidal, pelagic and marine benthic zone. Coral reef and continental shelf. Physico-chemical properties of marine ecosystem - Light, temperature, thermal stratification, dissolved solids, turbidity, dissolved gases, oxygen, carbon dioxide, salinity and density of sea water. **(12 Hours)**

UNIT IV

Physiology and adaptation: Feeding and respiration in aquatic organisms, osmoregulation in freshwater and marine organisms, sensory world of aquatic organisms, locomotion in water, adaptation of hill- stream fishes and adaptation of deep-sea organisms. **(12 Hours)**

UNIT V

Aquatic pollution: Causes of pollution - Agricultural, industrial, sewage, thermal and oil spills, eutrophication, management and conservation. Water pollution acts of India, sewage treatment and water quality assessment - BOD and COD. Environmental sustainability. Control of aquatic weeds, predatory and weed fish control. Feeds for cultivable species - natural, supplementary and artificial feeds. **(12 Hours)**

COURSE BOOK:

1. Subrahmaniyam, N.S. and Sambamurty, A.V.S.S. Ecology, Narosa Publishing House, New Delhi, 2000.

UNIT	BOOK	CHAPTERS
I	1	3
II	1	2, 14,16,
III	1	17
IV	1	31
V	1	23, 30

BOOKS FOR REFERENCE:

1. Tonapi G.T, Freshwater animals of Indi, Oxford and IBH Publishing Company, New Delhi, India, 2014.
2. Blakey D.R and D.C. Hrusa, Inland Aquaculture development handbook, Fishing News Books Great Britain, 1989.
3. Jhingran V.J, Fish and Fisheries of Indian Hindustan Publishing Co, New Delhi, 1985.
4. Pillay T.V.R, Aquaculture Principles and Practices, Fishing News Books, Oxford, 1990.
5. Santha Kumar G and Selvaraj, Concepts of Aquaculture, Nagercoil: Meenam Publication, 2002.

DSE - 2 - CLINICAL LAB TECHNOLOGY

Semester: V **Hours: 4**

Code : 24ZB5DE2A **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the measures of Laboratory safety, Human health and principles of biomedical instrumentation	PSO -2	K1
CO - 2	Interpret medical terminologies and clinical significance	PSO - 1	K2
CO - 3	Construct the lab requirements and diagnostic methods for clinical laboratory workers	PSO - 3	K3
CO - 4	Connect the diverse knowledge on lab technology and Health care	PSO - 5	K4
CO - 5	Develop training skills to attain employment in hospitals and Laboratories.	PSO - 4	K5

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

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

Semester: V				**DSE - 2 - CLINICAL LAB TECHNOLOGY**								**Hours:4**
Code : 24ZB5DE2A												**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	4	5	3	3	3	4	5	3	4	3	3.73
CO - 2	5	4	4	3	3	3	5	4	3	4	3	3.73
CO - 3	2	4	3	5	3	3	2	3	5	4	3	3.36
CO - 4	3	4	3	4	5	5	3	3	4	4	5	3.91
CO - 5	3	5	3	4	3	3	3	3	4	5	3	3.55
Overall Mean Score												**3.66**

Result: The Score for this Course is **3.66** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Laboratory Safety measures: Safety precautions against infection. Major causes of laboratory hazards, universal precautions for laboratories, maintenance and promotors of health. Specimen collection and processing of blood. urine, sputum and stool. **(12 Hours)**

UNIT II

Hematology: Composition of blood, collection and storage of blood, haemogram, cell study - counting of cells, differential count, total count), packed cell volume (PCV), erythrocytes sedimentation rate (ESR), haemoglobin concentration (Hb), bleeding time (BT), clotting time (CT), blood grouping and Rh - typing, blood cross matching, cell indices - mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC). Blood pressure (Sphygmomanometer) and reading of arterial pulsation. **(12 Hours)**

UNIT III

Analysis of urine and sputum - Physical properties of urine - colour, volume, specific gravity, odour and pH. Chemical composition of Urine - urine sugar, albumin, bile salts, bile pigments and ketone bodies, microscopic examination of organised sediments and unorganized sediments. Pregnancy test (detection of HCG). Analysis of sputum - macroscopic and microscopic examination of sputum. Gram stain and acid-fast Bacilli (AFB). **(12 Hours)**

UNIT IV

Clinical chemistry - Blood glucose, blood urea, blood uric acid, blood cholesterol and Blood Creatinine. WIDAL test for enteric and non-enteric fever, (VDRL) Venereal Disease Research Laboratory, virginity test**.** Analysis of seminal fluid - physical examination, chemical examination, Florence test, Barberio's test, microscopic examination - motility of sperm and precipitin test. **(12 Hours)**

UNIT V

Medical instrumentation - Computer tomography (CT scan), Magnetic Resonance imaging, flowcytometry, treadmill test, PET, Electrocardiogram (ECG), ultra-sonography, Electroencephalography (EEG). **(12 Hours)**

COURSE BOOKS:

1. Kanai L., Mukherjee, volume 1, Medical Laboratory Technology. A Procedure Manual for Medical Laboratory Technology. Routine diagnostic test, 2005.
2. Kanai L., Mukherjee, volume II, Medical Laboratory Technology. A Procedure Manual for Medical Laboratory Technology. Routine diagnostic test, 2005.
3. Ochei J, A.Kolhatkar, Medical laboratory Science, Tata McGraw Hill publishing company limited, New delhi, 2000.

UNIT	BOOK	CHAPTERS
I	1	1 , 2, 3
II	1	8, 9, 10, 11, 12
III	2	25
IV	2	23, 24, 27, 28
V	1 3	4 2, 3

BOOKS FOR REFERENCE:

1. Philip Evans. The family Medical Reference Book the essential Guide to Health and Medicine. Published by Little Brown under the Black cat imprint, London, 1993.
2. Isidro Aquilar and Herminia Galbes, Encyclopedia of Health and
3. Education for the family. Education and Health Library, Published under the title of Encyclopedia familiarrida, Amor Y sexo, 1999.

DSE - 2 - LIVESTOCK MANAGEMENT AND ANIMAL HUSBANDRY

Semester: V **Hours: 4**

Code : 24ZB5DE2B **Credit: 3**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall the importance of livestock in the health and economy of rural and urban populations.	PSO - 1	KI
CO - 2	Understand the different characteristics of breeding stock and breeding systems in Livestock	PSO - 2	K2
CO - 3	Apply principles and methods of immunization against specific diseases and implement vaccination and deworming practices.	PSO - 5	K3
CO - 4	Relate the activities and government schemes on livestock management	PSO - 4	K4
CO - 5	Evaluate preventive measures and control strategies for infectious diseases in livestock	PSO - 3	K5

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

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

Semester: V				**DSE - 2 - LIVESTOCK MANAGEMENT AND ANIMAL HUSBANDRY**							**Hours: 4**
Code : 24ZB5DE2B											**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	2	3	3	5	2	2	4	3	3.18
CO - 2	4	4	5	2	3	3	4	5	2	4	3	3.55
CO - 3	2	3	3	3	5	5	2	3	3	3	5	3.36
CO - 4	3	5	2	2	3	3	3	2	2	5	3	3.00
CO - 5	3	4	3	5	4	4	3	3	5	4	4	3.82
Overall Mean Score												**3.38**

Result: The Score for this Course is **3.38** **(**High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Dairy Farming: Introduction, importance of livestock in the health and economy of rural and urban population, Breeds of cattle: Gir and Sindhi. Fresian raising calf, Heifer management, care of pregnant cow and feeding of milch cows. Cattle feed formula and important fodder varieties. Housing, breeding - estrous cycle, artificial insemination of milch cows and parturition. Clean milk production and economic importance of dairy farming. **(12 Hours)**

UNIT II

Goat farming: Introduction, indigenous breeds - Jamunapari, Tellicherry and Barbari. Exotic breeds - Saanen and Toggenberg. Selection of breeding stock, reproduction and mating system. Nutrient requirement and stall-fed system of goat roaring. Management of goat farming and economic importance of goat farming. **(12 Hours)**

UNIT III

Sheep Farming: Introduction to sheep farming. Breeds: Indigenous breeds - Hissardale, chokla, malpura, Nellor and Mandya. Breeds of Tamil Nadu - Mecheri and Madras red. Exotic breeds - Merino and Dorset. Selection of breeding stock, breeding system, feeding nutrient requirements, management and economic importance of sheep farming. Dairy development schemes of India - Dairy entrepreneurship development schemes (DEDS). **(12 Hours)**

UNIT IV

Swine farming: Characteristic and their production, selection of breeds: large white -Yorkshire and Berkshire. Selection of breeding stocks, Nutrients requirements, weaning, feeding housing and reproduction. Care and management of pregnant sows, Economic importance of swine farming. Utility Advantages and disadvantages of pig farming. **(12 Hours)**

UNIT V

Animal Diseases and Preventive methods: Etiology, epidemiology pathogenesis, symptoms, postmortem lesions, diagnosis, and control measures of any three infectious diseases of cattle, sheep, goat and pigs. Diagnosis and treatment of non-specific conditions like impaction, Bloat, Diarrhea, Indigestion, dehydration, stroke, poisoning. Vaccination and deworming, Principles and methods of immunization of animals against specific diseases - herd immunity - disease free zones - 'zero' disease concept - chemoprophylaxis. Visit any one farm. **(12 Hours)**

COURSE BOOK:

1. Tarit Kumar Banerjee, Applied Zoology, New Central Book Agency Private Limited, London, 2016

UNIT	BOOK	CHAPTERS
I	1	9
II	1	11
III	1	13
IV	1	12
V	1	9.11.12.13

BOOKS FOR REFERENCE:

1. Shiv Prasad, A. Kumaresan, S. S. Lathwal Mukesh Bhakat, A. Manimaran New Paradigms in Livestock Production from traditional to commercial farming and beound New Delhi, 2013.
2. Andrew L. Winton and Kate Barber Winton. Milk and milk products Agrobios (India), Agro house, Chopasani Road, Jodhpur, 2012.
3. Behera U.K. A Text book of Farming systems. Agrotech publishing academy, 11A-Vinayak Complex-B, Durga nursery Road, Udaipur, 2014.
4. Banerjee G.C. A Text Book of Animal Husbandry. 7/e. Oxford & IBH Publ., New Delhi, 1992.

DSE - 2 - WILD LIFE CONSERVATION AND MANAGEMENT

Semester: V **Hours: 4**

Code : 24ZB5DE2C **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 terms employed in the conservation of wildlife.	PSO - 2	K1
CO - 2	Understand the key components of conservation policies and acts.	PSO - 4	K2
CO - 3	Analyse the characteristics of fauna and their adaptation to wildlife habitats	PSO - 1	K3
CO - 4	Apply regional and national approaches for biodiversity conservation to real-world scenarios.	PSO - 5	K4
CO - 5	Evaluate the effectiveness of wildlife trade legislation preventing illegal wildlife trade.	PSO - 3	K5

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

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

Semester: V			**DSE 2 - WILD LIFE CONSERVATION AND MANAGEMENT**								**Hours: 4**
Code : 24ZB5DE2C											**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	4	5	2	3	3	3	5	2	4	3	3.36
CO - 2	3	5	2	2	3	3	3	2	2	5	3	3.00
CO - 3	5	3	3	2	3	3	5	3	2	3	3	3.18
CO - 4	4	3	3	2	5	5	4	3	2	3	5	3.55
CO - 5	3	3	3	5	4	4	3	3	5	3	4	3.64
Overall Mean Score											**3.35**

Result: The Score for this Course is **3.35** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Biodiversity Extinction and Conservation Approaches: Perspectives and Expressions. Identification and prioritization of Ecologically Sensitive Area (ESA). Coarse filter and fine filter approaches. Regional and National approaches for biodiversity conservation. **(12 Hours)**

UNIT II

Theory and Analysis of Conservation of Populations: Stochastic perturbations - Environmental, Demographic, spatial and genetic stochasticity. Population viability analysis-conceptual foundation, uses of PVA models. Management decisions for small populations using PVA models. Minimum viable populations and recovery strategies for threatened species. **(12 Hours)**

UNIT III

National and International Efforts for Conservation: International agreements for conserving marine life, Convention on wetlands of International Importance (Ramsar convention), Conservation of Natural Resources. Overview of conservation of Forest and Grassland resources. CITES, IUCN, CBD National Forest Policy, 1988, National Wildlife Action Plan 2017-2031, Wildlife Protection Act 1972, National and State Biodiversity Action Plans and other Forests and Environmental Acts **(12 Hours)**

UNIT IV.

Wildlife Conservation in India: Wildlife wealth of India and threatened wildlife, Reasons for wildlife depletion in India, Wildlife conservation approaches and limitations. Wild life habitat: Characteristics, fauna and adaptation with special reference to Tropical Forest. Protected Area concept: National Parks, Sanctuaries and Biosphere Reserves, cores and Buffers, Nodes and corridors. Community reserve and conservation reserves. **(12 Hours)**

UNIT V:

Management of Wildlife: Distribution, status. habitat utilization pattern, threats to survival of Slender Loris, Musk deer, Great Indian Bustard, Olive Ridley turtle. Wild life Trade and legislation, assessment, documentation, prevention of trade, wild life laws and ethics. **(12 Hours)**

COURSE BOOK:

1. S.C. Santra,Environmental Science, New central Book Agency, 2005
2. K.K.Saxeena, Recent Advances in Environmental Analysis, University Book House Pvt Ltd, 2005
3. Archana Sharma, Environment, Face the challenge Academy, 2016

UNIT	BOOK	CHAPTERS
I	1	6
II	3	1,5
III	2	14
IV	2	19
V	1	8

BOOKS FOR REFERENCE:

1. Ali, S. and Ripley, D.S. A compact Handbook of Birds of Indian subcontinent. OUP, Bombay, 1987.
2. Bookhout, T.A. Research and Management Techniques for Wildlife and Habitats (5th edition) The Wildlife Society, Allen Press, 1996.
3. Caughley, G., and Sinclair, A.R.E. Wildlife Ecology and Management. Blackwell Science, 1994.
4. Gee, E. P.The wildlife of India. Harper Collins Publication, 2000.
5. Hunter, M.L., Gibbs, J.B. and Sterling, E.J. Problem solving in conservation biology and wildlife management: Exercises for class, field, and laboratory, Blackwell Publishing, 2008.
6. John Wiley. Caughley and Gunn. Conservation Biology in Theory and Practice. Blackwell,1996
7. Magurran, A.E. Ecological diversity and its measurements. Croom - Helm Ltd, 1991.
8. Sutherland, W.J, The Conservation Handbook: Research, Management and Policy. Blackwell Sciences, 2001.
9. Wodroffe, G. Wildlife conservation and modern zoo. Saiga Publishing Co., England,1991
10. Woodroffe, R., Thirgood, S. and Rabinowitz, A. People and wildlife, conflict or co-existence, Cambridge University,2005

INTERNSHIP

Semester: V

Code : 24ZB5IN01 **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 industrial set up.	PSO-1	K1
CO - 2	Explain the acquired knowledge and demonstrate the skills in Projects	PSO- 3	K2
CO - 3	Apply the principles involved in machineries and tools to the current scenario.	PSO - 5	K3
CO - 4	Develop their soft skills for their working environment in the near future.	PSO - 2	K4
CO - 5	Emerge as an Entrepreneurs.	PSO-4	K5

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

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

Semester: V				**INTERNSHIP**							**Credit: 2**
Code : 24ZB5IN01											
Course Outcomes	**Programme Outcomes (PO)**						**Programme Specific Outcomes (PSO)**					**Mean Score of CO's**
	1	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	
CO - 1	5	3	4	4	3	3	5	4	4	3	3	3.73
CO - 2	3	3	4	5	3	3	3	4	5	3	3	3.55
CO - 3	2	3	3	4	5	5	2	3	4	3	5	3.55
CO - 4	2	4	5	4	3	3	2	5	4	4	3	3.55
CO - 5	2	5	3	4	4	4	2	3	4	5	4	3.64
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UG INTERNSHIP - GUIDELINES

I. Aim and Objective:

The internship aims to provide undergraduate students with hands-on exposure to real-world practices, bridging academic learning with practical experience, and preparing them for research careers or employment opportunities by gaining hands-on experience.

II. Duration:

Students shall undertake training for 6 days (30 hours) during the Fourth Semester summer vacation.

III. Place of Internship:

Students shall undergo internship in I**nstitutions / Organizations** approved by the Department.

IV. Internship Report:

Students should submit two typed copies of internship report (minimum 20 pages) along with the Attendance Certificate and Performance Report from the training institution.

V. Evaluation:

The report will be evaluated by a committee consisting of the HoD and Supervisor.

JACEP - EXTENSION

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

Code : 24SLPEX01 **Credit: 1**

COURSE OUTCOMES:

- Impart knowledge on education.
- Get awareness of environmental issues and solve the issues.
- Develop a concern for the voiceless and faceless and rectify it.
- Analyse the reasons for health problems and impart knowledge on a balanced diet.
- Apply different fields of knowledge to the society.

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**

DEVELOPMENTAL BIOLOGY

Semester: VI **Hours: 5**

Code : 24ZB6MC11 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Recall facts and basic concepts related to developmental biology	PSO - 1	K1
CO - 2	Summarize key developmental processes and their molecular mechanisms	PSO - 2	K2
CO - 3	Apply knowledge of developmental biology to analyze and solve problems in reproductive health	PSO - 4	K3
CO - 4	Analyze and compare different developmental processes	PSO - 3	K4
CO - 5	Critically evaluate recent developments in developmental biology	PSO - 5	K5

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

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

Semester: VI				**DEVELOPMENTAL BIOLOGY**							**Hours: 5**
Code : 24ZB6MC11											**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	4	3	3	5	3	4	4	3	3.73
CO - 2	3	3	5	3	3	3	3	5	3	3	3	3.36
CO - 3	3	5	4	4	4	4	3	4	4	5	4	4.00
CO - 4	4	4	4	5	3	3	4	4	5	4	3	3.91
CO - 5	3	3	4	4	5	5	3	4	4	3	5	3.91
Overall Mean Score												**3.78**

Result: The Score for this Course is **3.78**(High Relationship)

Note:

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

Values Scaling:

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

UNIT I

History of Developmental Biology - Germ plasm theory, recapitulation theory, origin of primordial germ cells. Gametogenesis - spermatogenesis, oogenesis, structure of male and female gametes, ovulation, fertilization-sperm attraction, acrosome reaction, fusion of egg and sperm, theories of egg activation, types of fertilization, parthenogenesis. **(15 Hours)**

UNIT II

Cleavage - patterns, types, physiology and factors affecting cleavage, gastrulation. Morphogenetic movements, fate map, development of chick based on the hours of incubation - 24, 48, 72 and 96 hrs. Organogenesis - development of heart, eye, and brain in chick. **(15 Hours)**

UNIT III

Nucleo-cytoplasmic interaction, nuclear transplantation, gradients, embryonic induction, primary and secondary organizers, regeneration. Metamorphosis in insects and amphibians. **(15 Hours)**

UNIT IV

Human development - male and female reproductive organs, hormonal control of ovulation and pregnancy, menstrual cycle, biological diagnosis of pregnancy. Gestation period, physiological changes during pregnancy and foetal growth - placenta, child birth, parturition, lactation, mishaps of pregnancy - ectopic pregnancy, abortion and stillbirth, prenatal diagnosis. **(15 Hours)**

UNIT V

Medical implications of Developmental Biology - birth control measures, infertility, Erythroblastosis foetalis, Twins - types. Test tube baby, ART (Assisted Reproductive Technology), teratogenesis. Stem cells and therapeutic cloning. Embryo culture, amniocentesis. **(15 Hours)**

COURSE BOOKS:

1. S. Chattopadhyay, An Introduction to Developmental Biology, Books and Allied Pvt Ltd, Kolkata, 2019.
2. M.A.Subramanian, Developmental Biology, MJP Publishers.

UNIT	BOOK	CHAPTER
I	1	1, 8, 9
II	1 2	10, 16 9
III	1	16-19
IV	1	12-14
V	2	18

BOOKS FOR REFERENCE:

1. Verma P.S. and V. K., Agarwal. Chordate Embryology. Chand and company Ltd, New Delhi, 2003
2. Balinsky B. I. An Introduction to Embryology. 2nd edition, East West Press (P) Ltd, Ansari Road, Dryagana, New Delhi,1981
3. Kanna. Text Book of Embryology. Discovery Publishing House, Prahlad Street, New Delhi. 2004
4. Mohan P. Arora., Embryology. 4th Edition, Himalaya Publishing House, Mumbai, 2002.
5. Scott. F. Gillbert, Michael J. F. Barresi, Developmental Biology, 11th edition, Sinauer Associates Inc, 2016.

GENETIC ENGINEERING AND rDNA TECHNOLOGY

Semester: VI **Hours: 5**

Code : 24ZB6MC12 **Credit: 4**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Describe the fundamental principles of recombinant DNA technology	PSO1	K1
CO - 2	Understand the process involved in the construction of recombinant DNA	PSO2	K2
CO - 3	Explore the diverse strategies involved in recombinant DNA technology	PSO4	K3
CO - 4	Analyze the tools and techniques employed in creating recombinant organisms.	PSO3	K4
CO - 5	Comprehend the various applications of r DNA technology in Science and Industry	PSO5	K5

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

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

Semester: VI				**GENETIC ENGINEERING AND rDNA TECHNOLOGY**								**Hours: 5**
Code : 24ZB6MC12												**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	4	4	5	3	3	4	4	3.82
CO - 2	3	2	5	3	4	4	3	5	3	2	4	3.45
CO - 3	2	5	4	3	4	4	2	4	3	5	4	3.64
CO - 4	2	3	4	5	4	4	2	4	5	3	4	3.64
CO - 5	3	4	3	2	5	5	3	3	2	4	5	3.55
Overall Mean Score												**3.62**

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

Note:

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

Values Scaling:

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

UNIT I

Introduction to Genetic Engineering: Scope, aim and historical perspectives. Tools used in Genetic Engineering: Restriction endonuclease - types. DNA Ligase, Reverse Transcriptase, Gene Cloning vectors - Plasmid - types and properties, Bacteriophage vectors - Lambda Phage vector, M13 bacteriophage, Plant vector - Ti Plasmid, Viral vectors - SV40, CaMV, Shuttle vectors - Expression vectors and cosmids. **(15 Hours)**

UNIT II

Construction of r - DNA: Preparation of desired gene from natural source and m-RNA, isolation of DNA and plasmid, insertion of desired gene into the plasmid, Gene transfer methods: Physical methods - Microinjection, Lipofection, Electroporation, Chemical methods: Calcium Precipitation method and Biolistic method. Biological method: Agrobacterium mediated gene transfer. **(15 Hours)**

UNIT III

Selection and Screening of Recombinants: Insertional inactivation, Blue-white selection of recombinants, Radioactive antibody test, Immunological assays, Hybridization techniques - Southern and Dot blot techniques, Genomic Libraries - Construction and Applications. **(15 Hours)**

UNIT IV

Molecular Techniques: Separation of biological molecules - Agarose Gel Electrophoresis (AGE), SDS-PAGE, Polymerase Chain Reaction (PCR), RFLP, RAPD, DNA Fingerprinting, Sequencing - Maxam and Gillbert sequencing and Sangers sequencing, Automated sequencing. **(15 Hours)**

UNIT V

Applications of Recombinant DNA Technology: Transgenic Plants -Bt Cotton, Golden Rice, Flavr Savr Tomato, Herbicide and Insecticide Resistant Plants, Transgenic Animals - Fish, Mice, Sheep, and Cow. Animal cloning - Dolly. Production of insulin, growth hormones, and interferons**.** Gene therapy, Biosafety - Guidelines for industrial operations with GMO, Biohazards of rDNA technology.

(15 Hours)

COURSE BOOKS:

1. Satyanarayana U, Biotechnology, 12th edition, Uppala Publishers, Vijayawada, 2017

UNIT	BOOK	CHAPTERS
I	1	6
II	1	6
III	1	42, 49, 50
IV	1	33, 37, 41
V	1	58, 59, 61

BOOKS FOR REFERENCE:

1. Dubey R.C, A text Book of Biotechnology, 2nd edition, S. Chand Publications, 2012.
2. Brown T.A., Gene cloning - An Introduction, 3rd edition, UK: Stanley Thornes Pub. Ltd, 1995.
3. Das H.K., Text Book of Biotechnology, New Delhi: Wiley Dreamtech India Pvt. Ltd., 2004.
4. Watson, J.P., Gilman, M., Witowski. J and Zoller.M., Recombinant DNA, 2nd edition, New York: Freeman & Company
5. Walker J.M. and Rapley Molecular Biology and Biotechnology, 4th edition, New Delhi: Panima Publications 2003.

ECOLOGY AND EVOLUTION

Semester: VI **Hours: 6**

Code : 24ZB6MC13 **Credit: 5**

COURSE OUTCOMES

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	State key ecological and evolutionary concepts	PSO -1	K1
CO - 2	Distinguish environmental concepts focusing on their components, adaptation and conservation and also understand the process of Evolution through the theories	PSO - 2	K2
CO - 3	Apply ecological principles to address global environmental issues and relate the evidences of Evolution.	PSO - 4	K3
CO - 4	Correlate the ecological principles to real-world problems and compare and contrast the evolutionary mechanisms and evaluate their roles in driving evolutionary processes	PSO - 3	K4
CO - 5	Evaluate the interactions of environmental factors and hazards considering their impact on life and assess how evolutionary processes contribute to the diversity of life on earth	PSO - 2 PSO - 5	K5

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

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

Semester: VI				**ECOLOGY AND EVOLUTION**							**Hours: 6**
Code : 24ZB6MC13											**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	3	4	3	3	3	5	4	3	3	3	3.55
CO - 2	3	3	5	4	4	4	3	5	4	3	4	3.82
CO - 3	3	5	3	4	3	3	3	3	4	5	3	3.55
CO - 4	3	4	4	5	3	3	3	4	5	4	3	3.73
CO - 5	3	3	5	3	5	5	3	5	3	3	5	3.91
Overall Mean Score												**3.71**

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

Note:

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

Values Scaling:

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

UNIT I

Ecological components and Interactions: Abiotic factors and its ecological role - soil, light, temperature, water. Biogeochemical cycles - Carbon, Sulphur, Nitrogen and Phosphorous. Animal relationships: - Mutualism, commensalism, parasitism, competition, predation**.** Population Ecology - Population dynamics and growth curves. Community Ecology. **(15 Hours)**

UNIT II

Habitat Ecology: Characteristic features, types and faunal adaptations in Freshwater (Lotic and lentic), Marine, estuarine, cave, forest and desert habitat. **(15 Hours)**

UNIT III

Biodiversity Conservation and Disaster management: Biodiversity: Definition, characterization, levels, types and values. Mega diversity countries, Diversity hotspot, IUCN categories of threatened species, biodiversity and sustainable development, gene banks, cryopreservation. Disaster management - definition, factors and significance, difference between hazard and disaster. Natural disasters - earthquakes, volcanic eruption, landslides, snow avalanches, floods, cyclones, tsunami and droughts. Man made disasters - fires and forest fires, nuclear, biological and chemical disasters, road accident. **(15 Hours)**

UNIT IV

Evidences of Evolution: Origin of life - Abiogenesis, Biogenesis, Evidences for evolution from Morphology and comparative anatomy and embryology. **Theories of Organic Evolution:** Lamarckism, Neo Lamarckism, Darwinism, Neo Darwinism. **(15 Hours)**

UNIT V

Adaptation and Isolation: Adaptation - Coloration and Mimicry (types and significance), Isolation - mechanism and types. Speciation - mechanism of speciation and patterns of speciation. Fossil - Fossil formation, types of fossils, significance of fossils, living fossils and geological time scale. **(15 Hours)**

COURSE BOOKS

1. Verma, P.S. and Agarwal V. K. Principles of Ecology. S. Chand and Co. Pvt. Ltd., New Delhi, 1986
2. Trivedi, P.C. and Sharma, K.C. Biodiversity Conservation. Avishek Publishers, Jaipur, 2003.
3. Veer Bala Rastogi, Organic Evolution,13th Edition, Medtech Publication, New Delhi, 2018

UNIT	BOOK	CHAPTERS
I	1	8, 9, 10, 11, 13, 14, 15, 16, 19
II	1	20, 21, 22
III	2	3, 4, 7, 8
IV	3	1, 2, 3
V	3	8, 11, 17, 19, 20

BOOKS FOR REFERENCE:

1. Eugene P. Odum, Murray Barrick, Gary W. Barret. Fundamentals of Ecology, 5thedition. Brooks Cole Publishers, UK, 2005.
2. Begon and Mortimer, Population Ecology. UBS Publishers, Delhi, 1992.
3. Kormondy, Edward, J. Concept of Ecology. Prentice Hall of India Pvt., Ltd., Delhi,1994
4. Sharma, P.D. Ecology and Environment. Rastogi Publications, Meerut, 1999.
5. Dash, M.L. Fundamentals of Ecology. Tata McGraw Hill Publishing Company Ltd., New Delhi, 1996.
6. Trivedi, R.N, Textbook of Environmental Sciences. Anmol Publications Pvt. Ltd., New Delhi.1993
7. Hall B.K and Hallgrimsson B, Evolution, Jones and Bartlett Publishers.
8. Bell, G. The basics of selection. New York, Chapman and Hall, 1996.
9. Kamshilor M.M. Evolution of the Biosphere. MIR Publishers, Moscow, 1974.
10. Sanjib Chattopadhyay, Evolution, Adaptation & Ethology, Books and Allied (P) Ltd., Kolkata, 2012.
11. Mani M.S, Ecology & Evolution. Sathish Book Enterprise, Agra,1983
12. Williams, G.C., Natural Selection: Domains, Levels and Challenges. New York: Oxford Univ. Press, 1992.
13. Barton N.H, Briggs DEG, Eisen JA, Goldstein DB and Patel NH, Evolution. Cold Spring, Harbour Laboratory Press.

DEVELOPMENTAL BIOLOGY, rDNA TECHNOLOGY, ECOLOGY AND EVOLUTION - LAB

Semester: VI **Hours: 4**
Code : 24ZB6CP05 **Credit: 2**
COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Identify the key components of aquatic and terrestrial eco system	PSO - 1	K1
CO - 2	Demonstrate a comprehensive understanding of the developmental processes in animals	PSO - 2	K2
CO - 3	Apply the biotechnological methods in the separation and analysis of biomolecules	PSO - 3	K3
CO - 4	Integrate the ecological principles in the conservation of ecosystem and biodiversity	PSO - 5	K4
CO - 5	Appraise the evolutionary significance of Animals.	PSO - 4	K5

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

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

Semester: VI			**DEVELOPMENTAL BIOLOGY, rDNA TECHNOLOGY ECOLOGY AND EVOLUTION - LAB**							**Hours: 4**
Code : 24ZB6CP05										**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	4	4	3	3	5	4	4	2	3	3.55
CO - 2	4	2	5	3	3	3	4	5	3	2	3	3.36
CO - 3	3	3	4	5	4	4	3	4	5	3	4	3.82
CO - 4	3	3	3	4	5	5	3	3	4	3	5	3.73
CO - 5	2	5	2	4	4	4	2	2	4	5	4	3.45
Overall Mean Score												**3.58**

Result: The Score for this Course is **3.58** (High Relationship)

Note:

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

Values Scaling:

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

DEVELOPMENTAL BIOLOGY:

1. Mounting of chick blastoderm
2. Study of 24-, 48- and 72-hours chick embryo
3. Observation of developmental stages up to gastrula of frog
4. Placental types - Diffuse, Cotyledonary, Zonary and Discoidal.
5. Effect of Thyroxin in tadpoles (in batches)
6. Study of regeneration of tail in tadpoles (in batches)

rDNA TECHNOLOGY

1. Isolation of DNA from Spleen
2. Isolation of DNA from Plant source
3. Separation of DNA using Agarose Gel Electrophoresis (AGE).
4. Thin layer Chromatography (TLC)
5. Spotters:
    a. Western blotting
    b. Southern blotting,
    c. Vector pBR 322

ECOLOGY

1. Estimation of dissolved oxygen in various water samples - Winkler's method
2. Study of a pond ecosystem
3. Mounting of freshwater plankton
4. Sampling of plant population by quadrate method and line transect method in terrestrial habitat
5. Measurement of water turbidity using Secchi disc
6. Study of food chain and food web from fresh water and terrestrial environment.
7. Field visit - Pond and forest ecosystem

EVOLUTION

1. Homologous and Analogous organs, vestigial organs
2. Examples of Evolutionary Significance
    a. Peripatus
    b. Leaf Insect
    c. Stick Insect
    d. Chamaeleon
3. Adaptive Radiation
4. Dermatoglyphics

PROJECT

Semester: VI **Hours: 4**

Code : 24ZB6PR01 **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 - 3	K2
CO - 3	Apply various skills to solve the problem.	PSO - 2	K3
CO - 4	Interpret their findings in the respective field.	PSO - 5	K4
CO - 5	Present the outcome of their project.	PSO - 4	K5

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

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

Semester: VI				**PROJECT**							**Hours: 4**
Code : 24ZB6PR01											**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	4	4	5	3	3	4	4	3.82
CO - 2	2	3	2	5	3	3	2	2	5	3	3	3.00
CO - 3	2	4	5	4	3	3	2	5	4	4	3	3.55
CO - 4	2	3	3	4	5	5	2	3	4	3	5	3.55
CO - 5	2	5	2	3	4	4	2	2	3	5	4	3.27
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= $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

UG PROJECT - GUIDELINES

I. Aim and Objective:

The project helps students to gain practical experience in research, apply class room learning, build problem-solving, analytical, and presentation skills.

II. Topic Selection:

Students shall select a project **topic relevant to their discipline** in consultation with their Guide.

III. Formatting the Report:

Students need to submit two copies of the final report. The report should not exceed 25 pages in A4 size paper, 1.5 line spacing, Times New Roman Font Style and Font Size 12.

IV. Submission of Project Report:

Students should submit the final project report through the Guide and the Head of the Department (HoD) to the Controller of Examination (CoE) on or before the stipulated date given by the Controller of Examination.

V. Viva Voce Examination:

Students should prepare a Power Point presentation (10 - 15 slides) summarizing the project report and present it before the Guide and the External Examiner.

DSE - 3 - BIOINFORMATICS

Semester: VI **Hours: 3**

Code : 24ZB6DE3A **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 the fundamental concepts of Bioinformatics	PSO - 1	K1
CO - 2	Understand the methods of storing and analysing biological molecules	PSO - 2	K2
CO - 3	Apply the computational tools to interpret the biological data	PSO - 3	K3
CO - 4	Evaluate the methods to analyse the structural and functional properties of genes and protein and their significance in Drug designing.	PSO - 5	K4
CO - 5	Analyse the diverse applications of bioinformatics in Biology.	PSO - 4	K5

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

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

Semester: VI				**DSE - 3 - BIOINFORMATICS**							**Hours:3**
Code : 24ZB6DE3A											**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	4	3	4	4	5	4	3	4	4	4.00
CO - 2	3	4	5	3	4	4	3	5	3	4	4	3.82
CO - 3	4	3	4	5	3	3	4	4	5	3	3	3.73
CO - 4	3	4	4	3	5	5	3	4	3	4	5	3.91
CO - 5	3	5	3	4	4	4	3	3	4	5	4	3.82
Overall Mean Score												**3.86**

Result: The Score for this Course is **3.86** (High Relationship)

Note:

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

Values Scaling:

Mean Score of COs = 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 Bioinformatics: History, Scope, Applications of Bioinformatics Introduction to databases - classification and types, biological databases, Nucleic acid sequence databases - NCBI, EMBL, GenBank, Protein sequence databases - Swiss Prot and TrEMBL, Literature Databases - Pubmed. **(9 Hours)**

UNIT II

Biological Sequence alignment: Local and Global alignment - Dot Matrix, pair wise alignment - FASTA, BLAST. Multiple sequence alignment- Clustal W -Uses of sequence analysis. **(9 Hours)**

UNIT III

Phylogenetic Analysis: Construction of Phylogenetic tree - Rooted vs Unrooted tree - Methods of constructing Phylogenetic tree, UPGMA, Neighbor joining method - Software's for Phylogenetic Analysis - Applications **(9 Hours)**

UNIT IV

Structural Bioinformatics - Types of Protein structure -Primary, Secondary and Tertiary structures**,** Protein structure Database - PDB, Protein structure visualization tools - Rasmol, Pymol.Structure Prediction - Homology Modelling. **(9 Hours)**

UNIT V

Introduction to Drug Designing - ADMET properties, Need for developing new drugs, Molecular modification of lead compounds; Active site determination of enzymes, Basics of Docking studies, Types, Steps and tools used for drug designing. **(9 Hours)**

COURSE BOOKS:

1. Jin Xiong, Essential Bioinformatics,1st edition, Cambridge University Press,2006
2. S.C. Rastogi, Namita Mandiratta, Bioinformatics, Concepts, skills and Applications, 2nd edition, CBS Publishers, 2019.

UNIT	BOOK	CHAPTERS
I	1	2
II	2 1	11,12 3
III	2 1	13 11
IV	2 1	16 12
V	2	18,19

BOOKS FOR REFERENCE

1. Sushil Kumar, Bioinformatics-Methods and Applications, 1st edition, Thomas Press, 2016.
2. Arthur M.Lesk, Introduction to Bioinformatics, 2nd edition, Oxford University press,2004
3. Subramanian C, A Textbook of Bioinformatics, 1st edition, Dominant Publishers, 2017.

DSE - 3 - ENTOMOLOGY AND PEST MANAGEMENT

Semester: VI **Hours: 3**

Code : 24ZB6DE3B **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Define the taxonomy and the functional morphology of Insects	PSO - 1	K1
CO - 2	Understand and characterise the different types of insect pests.	PSO - 2	K2
CO - 3	Assess the impact of beneficial insects in commercial industries.	PSO - 4	K3
CO - 4	Comprehend the significance of Insects and analysing their impact as pests in various ecosystems.	PSO - 5	K4
CO - 5	Evaluate the efficacy of integrated pest management strategies.	PSO - 3	K5

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

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

Semester: VI				**DSE - 3 - ENTOMOLOGY AND PEST MANAGEMENT**							**Hours: 3**
Code : 24ZB6DE3B											**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	2	3	3	3	5	2	3	3	3	3.18
CO - 2	4	3	5	3	3	3	4	5	3	3	3	3.55
CO - 3	2	5	2	4	3	3	2	2	4	5	3	3.18
CO - 4	4	4	3	3	5	5	4	3	3	4	5	3.91
CO - 5	3	4	3	5	3	3	3	3	5	4	3	3.55
Overall Mean Score -3.46												**3.47**

Result: The Score for this Course is **3.47** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Insect Taxonomy: Definition, scope of Entomology, insect diversity, principles of insect classification, classification up to orders, insect collection and preservation.

(9 Hours)

UNIT II

Insect Morphology: Types of antennae, mouth parts and legs, thorax, wings venation, wings modification, genitalia - structure and types, reproduction in insects - moulting and metamorphosis

UNIT III (**9 Hours)**

Concept of pest: Definition, classification of Pest. Concept of insect pest- definition, Biology of pest, pest of Rice (The Rice stem borer), pest of Cotton (Aphids and Bollworms), pest of vegetables (Fruit borer), pest of paddy (Grain moth and red flour beetle), mode of action and control measures. **(9 Hours)**

UNIT IV

Pests of Economic importance: Biology, rearing and economic importance of silk worm, honey bees and lac insects, insects of medical and forensic importance. Internal feeders and external feeders. **(9 Hours)**

UNIT V

Methods of Pest Management: Methods of Pest control - physical, chemical, quarantine, mechanical, biological control methods, Integrated pest management, Appliances of pesticides - dusters and sprayers, Methods of Application - dusting, spraying, aerosol and aerial spraying **(9 Hours)**

COURSE BOOKS:

1. Nalina Sundari M.S, R. Santhi, Entomology, 1st edition, MJP Publishers, 2010.
2. Supriti Sarkar, Gautam Kundu, Korak Chaki, Introduction to Economic Zoology, 2nd edition, New central Book agency, 2016.

UNIT	BOOK	CHAPTERS
I	1	1, 2
II	1	2, 3
III	2 1	1, 2, 27, 28, 29
IV	1	6, 7
V	2	1, 2, 3

BOOKS FOR REFERENCE

1. Hill, D.S. Agricultural insect pests of the tropics and their control- Cambridge Univ. Press, 1983.
2. Atwal, A. S. Agricultural pests of India and south East Asia, 1979.
3. Dent, D, Insect pest management 2nd edition CAB International, 2000.
4. Roberts, D.A, Fundamentals of Plant Pest Control.1978.
5. De Bach, P, Biological Control of Insect Pests and Weeds, Chapman & Hall, New York, 1964.
6. Koul, O. and Dhaliwal, G.S. Phytochemical Biopesticides, Harwood Academic Publishers, Amsterdam, 2003.
7. Pedigo, L.P, Entomology and Pest Management, Prentice Hall, N. Delhi, 1996.

DSE 3 - INTRODUCTION TO FORENSIC SCIENCE

Semester: VI **Hours: 3**

Code : 24ZB6DE3C **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Apprehend the fundamental principles of Forensic science in crime investigations.	PSO 1	K1
CO - 2	Acquire skills to work in crime management including collection, preservation, and documentation of physical evidence.	PSO 4	K2
CO - 3	Comprehend the analysis of biological samples in crime investigations	PSO 2	K3
CO - 4	Utilize biological, chemical, and physical and molecular techniques to analyse fingerprints, blood, DNA, and toxic substances.	PSO 3	K4
CO - 5	Interpret the biological analysis and to draw scientifically valid Conclusion.	PSO 5	K5

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

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

Semester: VI				DSE 3 -INTRODUCTION TO FORENSIC SCIENCE								Hours:3
Code : 24ZB6DE3C												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	4	4	5	3	3	4	4	3.82
CO - 2	3	5	4	4	4	4	3	4	4	5	4	4.00
CO - 3	3	3	5	4	3	3	3	5	4	3	3	3.55
CO - 4	3	4	4	5	3	3	3	4	5	4	3	3.73
CO - 5	3	3	3	4	5	5	3	3	4	3	5	3.73
Overall Mean Score												3.77

Result: The Score for this Course is **3.77** (High Relationship)

Note:

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

Values Scaling:

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

UNIT I

Introduction to Forensic Science: Introduction. Types of crime scenes -indoor, outdoor and underwater, Functions of Forensic Science Laboratories - National and International Organizations - FSL, CBI, INTERPOL.

UNIT II

Forensic Biology: Basic principles of Forensic Biology, Collection of samples - Classification and cataloguing of evidences - collection, preservation and transportation. Frye case and Dauber standard. - Forensic significance of semen, blood, hair saliva, sweat, milk and urine.

UNIT III

Forensic Haematology: Bloodstain Pattern Analysis - Bloodstain characteristics, Cellular antigens - ABO blood groups, Role of Extracellular proteins and intracellular enzymes in blood sample analysis. Types and identification of microbial organisms of forensic significance.

UNIT IV

Forensic Toxicology: Analysis of poisons and toxins in biological samples, toxicological screening methods - immunoassays, chromatography, advanced drug detection methods - narcotics, stimulants, and alcohol levels in blood, doping test.

UNIT V

Molecular Forensics: DNA typing techniques - DNA fingerprinting in forensic investigations and paternity disputes, STR, SNPS, mtDNA, Y-chromosome analysis

LINKS FOR REFERENCE

UNIT	WEBLINK
I	https://avscollege.ac.in/notes/fs/STUDY%20MATERIAL%20-%20BASICS%20OF%20FORENSIC%20SCIENCE.pdf
II	https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P000699/M011528/ET/1516257136FSC_P12_M2_e-text.pdf
III	https://www.bhu.ac.in/Content/Syllabus/Syllabus_30062020041910324 3.pdf
IV	https://uploads-ssl.webflow.com/605fe570e5454a357d1e1811/60a182d2fb4903f538a456f2_SS-Forensic-Science.pdf
V	https://content.e-bookshelf.de/media/reading/L-567773-ba67de1e2d.pdf

BOOKS FOR REFERENCE:

1. Houck, M.M, & Siegel, J.A, Fundamentals of Forensic Science. Academic Press, London, 2006.
2. Sharma, B.R, Forensic Science in Criminal Investigation & Trials. Universal Publishing Co, New Delhi, 2002.
3. Barry, A.J, Fisher, Techniques of Crime Scene Investigation, 7th Ed, CRC Press, 2003.

SEC 4 - CELL CULTURE TECHNIQUES

Semester: VI **Hours: 3**

Code : 24SE6ZB01 **Credit: 2**

COURSE OUTCOMES:

CO. NO.	UPON COMPLETION OF THIS COURSE THE STUDENTS WILL BE ABLE TO	PSO ADDRESSED	COGNITIVE LEVEL
CO - 1	Attain knowledge on the basic fundamentals of Cell Culture.	PSO - 1	K1
CO - 2	Understand the process of culturing, establishing, and maintaining cell lines.	PSO - 2	K2
CO - 3	Apply cell culture techniques to establish and maintain standardized cell lines in a laboratory setting	PSO - 3	K3
CO - 4	Relate the biological properties of various cultured cells and their associated biohazards in laboratory	PSO - 4	K4
CO - 5	Interpret the diverse skills and principles employed in cell culture biology.	PSO - 5	K5

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

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

Semester: VI				**SEC 4 - CELL CULTURE TECHNIQUES #**							**Hours:3**
Code : 24SE6ZB01											**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	4	3	3	3	5	4	3	4	3	3.73
CO - 2	4	3	5	4	4	4	4	5	4	3	4	4.00
CO - 3	3	3	4	5	3	3	3	4	5	3	3	3.55
CO - 4	3	5	4	4	3	3	3	4	4	5	3	3.73
CO - 5	4	4	4	3	5	5	4	4	3	4	5	4.09
Overall Mean Score												**3.82**

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

Note:

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

Values Scaling:

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

UNIT I

Introduction to Cell Culture: Characteristics of Cultured Cells -Cell adhesion, Cell Proliferation - Cell Differentiation - Metabolism of cultured cells. Initiation of Cell Culture, Evolution and Development of cell lines **(9 Hours)**

UNIT II

Plant Tissue Culture: Introduction, History, Types of culture - Callus culture, Suspension culture, Micropropagation, Protoplast culture. Plant Tissue Culture media - Constituents of media, Applications of Plant Tissue culture **(9 Hours)**

UNIT III

Animal Cell Culture: Introduction, History of Animal Tissue Culture, Culture Media - Types - Natural Media - Serum free Media, Types of Culture - Primary Cell Culture - Subculture - types, Cell lines - Finite cell lines, Continuous Cell lines - Maintenance of Cell lines. **(9 Hours)**

UNIT IV

Organ Culture -Organ Culture - definition - techniques for organ culture, Isolation of tissues - mouse and chick embryos - Human biopsy, Stem Cell Cultures - Characterization of stem cells, Applications of Cultured Stem cells. **(9 Hours)**

UNIT V

Facilities for Cell Culture - Laboratory requirements for Plant and Animal Tissue Culture - Infrastructure - Culture Room. Aseptic conditions - Sterilization. Advantages and Limitations of Tissue Culture. Biohazards and Laboratory safety measures. **(9 Hours)**

COURSE BOOKS:

1. Satyanarayana U, Biotechnology, 12th edition, Uppala Publishers, Vijayawada, 2017

UNIT	BOOK	CHAPTERS
I	1	35
II	1	42, 43
III	1	34, 36
IV	1	40
V	1	33

BOOKS FOR REFERENCE

1. Dubey R.C, A text Book of Biotechnology, 2nd edition, S. Chand Publications, 2012. Brown T.A., Gene cloning - An Introduction, 3rd edition, UK: Stanley Thornes Pub. Ltd, 1995.
2. Das H.K., Text Book of Biotechnology, New Delhi: Wiley Dreamtech India Pvt. Ltd., 2004.
3. Watson, J.P., Gilman, M., Witowski. J and Zoller.M., Recombinant DNA, 2nd edition, New York: Freeman & Company
6. Walker J.M. and Rapley Molecular Biology and Biotechnology, 4th edition, New Delhi: Panima Publications 2003.

SELF -STUDY COURSE

BIONOMICS

Semester: VI

Code : 24ZB6SS01 **Credit: 2***

COURSE OUTCOMES:

- Recall the fundamental ecological concepts such as ecosystems, population dynamics and community ecology.
- Describe the interrelationship between organisms and their environments.
- Apply ecological principles to analyze and solve environmental problems.
- Explain the relationship between abiotic and biotic factors in ecosystems.
- Evaluate the ecological implications of global issues and remedy measures.

UNIT I

Abiotic Factor: Introduction, scope, concept and branches in ecology - Autecology and synecology. Types of media and substratum: Water- Properties, forms of water, soft and hard water, air- composition and properties, soil - types, soil formation and soil profile.

UNIT II

Biosphere: Hydrosphere, lithosphere, atmosphere, temperature - Distribution of temperature, thermal stratification, temperature as a limiting factor and thermal adaptations. Light as a limiting factor. Ecosystem - characteristic features, components, types, food chain, food web, pyramids and tropic levels.

UNIT III

Biogeochemical cycles: Gaseous cycle (C, N_2 & S) and sedimentary cycle (phosphates). Animal association - Intra specific, inter specific - colony formation, social organization, predation, parasitism, commensalisms, mutualism and inter specific competition - Gause's principle (with one example each).

UNIT IV

Population: Definition, characteristics, natality, mortality, age distribution of population growth forms and population fluctuation. Community - Ecotone, edge effects and ecological succession. Conservation - Wild life management, preservation - laws enforced, sanctuaries and national parks. Natural resources management- renewable and non-renewable.

UNIT V

Environmental degradation: Deforestation, urbanization, population explosion and other environmental hazards. Environmental ethics and laws, role of governmental agencies for environmental sustainability and monitoring.

COURSE BOOK:

1. Arumugam N, Concepts of Ecology, Saras Publication, Nagercoil 2015.

UNIT	BOOK	CHAPTERS
I	1	1, 4, 5.
II	1	6, 7, 8, 11.
III	1	12, 13.
IV	1	9, 10, 20.
V	1	35

BOOKS FOR REFERENCE:

1. Kotpal. R.L, and N.P. Bali, Concepts of Ecology, Vishal Publications, New Delhi - 7. 1986.
2. Rastogi V.B, and M.S. Jayaraji, Animal Ecology and Distribution of animals, Kedar nath, Ram Nath Meerut - 250 001. 1988 - 1989
3. Clark, G.L., Elements of Eology, John Wiley & Sons Inc., New York, London. 1954.
4. Eugene P. Odum, Fundamentals of Ecology, Saunders International Student Edition, W.B. Saunders Company, Philadelphia London, Toronto. 1971.
5. Agarwal. V.S., Strategies in Environmental conservation. Kalyani Publishers, New Delhi. 2001.
6. Odum E.P., Fundamentals of Ecology. 5th edition, Natraj Publication, Gayathri Offest, New Delhi. 2017.
7. Saha T.K., Ecology and Environmental Biology. Books and Allied (P) Ltd., Kolkata. 2013.
8. Trivedi, Ecology APH Publishing Corporation, New Delhi. 2012.
9. Verma P.S. and Agarwal V. K., Principles of Ecology. S. Chand and company Pvt. Ltd., New Delhi. 1992.
10. https:/www.slideshare.net/HarioMMehta2/population-explosion-78242237

DIETETICS

Semester: VI

Code : 24ZB6SS02 **Credit: 2***

COURSE OUTCOMES:

- Describe the role of food and nutrients in health and disease.
- Classify the nutrient needs and demonstrate food choices for infants, children, adolescents and adults.
- Illustrate the changes in body during the aging process.
- Explain the principles of diet therapy, modification of normal diet for therapeutic purposes and the role of dietician.
- Predict and prepare appropriate diets for therapeutic conditions.

UNIT I

Menu Planning - Principles of planning menus, steps involved in planning a menu; calorific value of food, nutritional requirements for infants and adults, nutritional requirements during artificial feeding and weaning.

UNIT II

Nutritional requirements for pre-school children (1 - 6 years), nutritional related problems of pre-schoolers. Nutritional and food requirements for school children (6 - 12 years), Nutritional requirements during adolescence.

UNIT III

Nutritional requirements for expectant mothers, lactating women, old age, Nutrition related problems of old age, Nutritional anaemia - Prevalence, types, Iron deficiency anaemia, Megaloblastic Anaemia, prevention.

UNIT IV

Diet in obesity and underweight, Diet in diseases of the Cardiovascular System, Role of fat in the development of atherosclerosis, saturated fatty acids, Trans fatty acids, Dietary management and dietary modification.

UNIT V

Diet in Diabetes mellitus -Types, symptoms. Diet in Cancer - Nutritional requirements and role of food in the prevention of cancer.

COURSE BOOK:

1. Srilakshmi B., Dietetics, 5th edition, New Age International P. Ltd. Publishers, New Delhi, 2005.

UNIT	BOOK	CHAPTERS
I	1	1, 2, 3.
II	1	4, 5, 6.
III	1	7, 8, 9, 10.
IV	1	14, 15.
V	1	18, 22.

BOOKS FOR REFERENCE:

1. Park and Park M.S., Preventive and Social Medicine. Banarsidas, Banat Publishers.2003
2. Nutrition and Diet Therapy. Times mirror/Mosby College Publishers,1989
3. Shakuntala Mary M. and N. Shadaksharaswathy. Food (Foods and Principles) New Age International P. LTD. Publishers, 2009.

BIOINSTRUMENTATION

Semester: VI

Code : 24ZB6SS03 **Credit: 2***

COURSE OUTCOMES:

- Explicate the principles underlying various bioinstrumentation techniques.
- Summarize the functioning of common bio instruments.
- Demonstrate the use of bio instruments in practical scenarios.
- Compare and contrast different bioinstrumentation methods, identifying their strength, weakness and optimal applications.
- Assess the appropriateness of different bioinstrumentation methods for specific applications.

UNIT I

Laboratory Practices: Guide lines, laboratory symbols, cleaning and sterilization of labware and reagents, handling and care of laboratory animals, Laminar flow hood - types and use. concepts of molecular weight, atomic weight, preparation of solutions of a particular molarity and percentage, Buffers - Definition and preparation of buffers, pH meter, safety and ethical issues in laboratory settings.

UNIT II

Microscopy: Light microscope, SEM, TEM, Atomic force microscope, Cryopreservation - principle and procedure, Fluorescence activated cell sorting, X-ray crystallography.

UNIT III

Bioinstrumentation: Working principle and types of centrifugations, Spectrophotometry, Mass spectrometry, Chromatography - Principle and types of chromatography, Elecrtophoresis - Principle and types of electrophoresis.

UNIT IV

Biomedical instrumentation: ESR measurement, haemoglobin measurement, blood pressure, blood flow, ECG, cardiac pacemakers, X-ray imaging, CT scan and NMR imaging, Ultrasound imaging, medical applications of laser, Biosensors - glucose biosensor, alcohol biosensor, artificial retina, environmental biosensors, cantilever-based biosensor, DNA biosensor.

UNIT V

Molecular Techniques: Isolation of DNA, RNA and proteins, Electrophoresis of DNA and proteins, polymerase chain reaction, ELISA, Immunofluorescence, Fluorescent in situ hybridization, Southern and Western blotting.

COURSE BOOK:

1. N. Arumugam and Kumaresan V., Biophysics and Bioinstrumentation. Saras Publication, Nagercoil, 2013.

UNIT	BOOK	CHAPTERS
I	1	2, 25, 29, 30
II	1	22.
III	1	16, 17, 18.
IV	1	14, 15.
V	1	26, 28

BOOKS FOR REFERENCE:

1. Veera Kumari, L. Bioinstrumentation, MJP Publishers, Chennai, 2007.
2. Boyer. R. Modern experimental Biochemistry 3rd Edition. USA: Addison Wesley Longman, Inc, 2000.
3. Mohanty, P. K. . Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana, 2000
4. Ludhiana Wilson, K. and Waljker, J Principles and techniques of Biochemistry and Molecular Biology (7th Edition). Cambridge University Press, UK, 2010
5. Van Holde, K. E. Johnson, W. C. and Ho, P. Principles of physical Biochemistry, 2nd Edition. Pearson Prentice Hall, New Jersey, 2006.
6. Sharma, V. K. Techniques in Microscopy and Cell Biology. Tata McGraw Hill Publishing Ltd., New Delhi, 1991.

IPR, BIOSAFETY AND BIOETHICS

Semester: VI

Code : 24ZB6SS04 **Credit: 2***

COURSE OUTCOMES:

- Attain knowledge on the types of Intellectual Properties and their importance in Research.
- Explain the fundamental principles of biosafety and assess their implications in Biotechnology
- Understand the biosafety protocols, ethical guidelines, and their implementation in biological research.
- Connect the concepts of biosafety, bioethics, and IPR in research and industry practices.
- Learn about national and international acts and regulations in following safety and ethical practices in Biotechnological research

UNIT I

INTRODUCTION TO IPR: Introduction to Intellectual property: Types of IPR: Patents, Trademarks, Trade secrets, Copyright, Industrial design, Traditional knowledge, Geographical Indications.

UNIT II

PATENTS: Patent - Definition - Types of Patents - Utility patents and Design - Patents - Introduction to Patent filing Procedures - Patentable and non-Patentable forms - Patenting Life - Legal Protection of Inventions

UNIT III

BIOSAFETY: Introduction to Biological safety, Biosafety Guidelines and regulations - Levels of Biosafety - Primary and Secondary containment - Recommended biosafety levels for infectious agent.

UNIT IV

BIOETHICS: Introduction - Definition - Necessity of Bioethics - Ethics in Research - Plagiarism - Ethical implications of Biotechnological techniques and Products - Ethical Guidelines for Research - ICMR, NIH.

UNIT V

NATIONAL AND INTERNATIONAL REGUALTIONS: International regulations - Cartagena Protocol - EPA Act and Rules - WTO International Agreements - Regulatory Advisory Committee - RCGM, GEAC, IBSC.

COURSE BOOK:

1. P.K. Gupta, Elements of Biotechnology, 2nd edition, Rastogi Publications, 2010.
2. Satyanarayana U, Biotechnology, 12th edition, Uppala Publishers, Vijayawada, 2017.
3. William Thiemann, Michael A. Palladino, Biotechnology, 4th edition, Pearson publications, 2014.

UNIT	BOOK	CHAPTERS
I	1	39
II	1	40
III	2	61
IV	3	12
V	3	13

BOOKS FOR REFERENCE:

1. Watson, J.P., Gilman, M., Witowski. J and Zoller., Recombinant DNA, 2nd edition, New York: Freeman & Company
2. Walker J.M. and Rapley Molecular Biology and Biotechnology, 4th edition, New Delhi: Panima Publications 2003.

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**