

**RVS COLLEGE OF ARTS AND SCIENCE**

Autonomous and Affiliated to Bharathiar University, Approved by AICTE

Reaccredited with 'A+' Grade by NAAC

Sulur, Coimbatore – 641 402, Tamilnadu, India.

Web: [www.rvscas.ac.in](http://www.rvscas.ac.in)

0422-2687421/603



Estd 1986

**RVS CAS**

Building Intellectual Capital

**DEPARTMENT OF BIOCHEMISTRY**

**B.Sc., BIOCHEMISTRY**

**2023-2026**

**HOD**

**PRINCIPAL**

**COE**

## **VISION**

Quality Education for Digital Era.

## **MISSION**

To impart a need – based quality education through comprehensive curriculum by adopting apt technologies and progressive teaching, learning and research processes.

## **ABOUT THE DEPARTMENT**

The Department of Biochemistry was established in 1996. The department is functioning with under graduate, Post graduate and Research programs with a team of 11 faculty members.

The Biochemistry focuses on life processes at the molecular level, that emphasis on the biochemistry and molecular biology of cellular metabolism and Bioenergetics.

The curriculum is designed for students seeking preparation for graduate studies, for the health-care professions, or for entry-level positions in science-related industries. The teaching and learning process is well executed properly and reveals with sophisticated instruments.

**EXECUTIVE MEMBERS**

**CHAIRMAN**

Dr. K.V. Kupusamy

**MANAGING TRUSTEE**

Dr. K. Senthil Ganesh

**CORRESPONDENT**

Mrs. S. Srividyalakshmi Senthil Ganesh

**SECRETARY**

Prof. Saramma Samuel

**PRINCIPAL**

Dr. T. Sivakumar

**VICE PRINCIPAL**

Dr. M.P. Ayyappadas

**CONTROLLER OF EXAMINATIONS**

Ms. G. Jeyalakshmi

**HEAD OF THE DEPARTMENT**

Dr. S.Shamina

### PROGRAMME OUTCOMES (POs)

PO1	Domain Knowledge
PO2	Communicative Competence
PO3	Digital Strategic Knowledge
PO4	Multi-Cultural Competence
PO5	Critical Thinking and Problem Solving
PO6	Research and Analytical Skills
PO7	Moral, Ethical and Professional Responsibilities
PO8	Leadership and Lifelong Learning

### PROGRAMME SPECIFIC OUTCOMES(PSOs)

Upon completion of **Bachelor of Biochemistry**, students are able to achieve the following outcomes.

PSO1	Apply to gain knowledge through lifelong learning to manage projects in multidisciplinary fields.
PSO2	Describe the fundamental concepts of specific molecules, cell, enzymes, organ system and metabolism of compounds
PSO3	Inspect technical aspects of molecular biology, clinical biochemistry, immunology and plant biochemistry via analytical skill and scientific knowledge domain.
PSO4	Implement in the field of health care sector and in various industries

**RVS COLLEGE OF ARTS AND SCIENCE (Autonomous)**  
**Sulur, Coimbatore – 641 402**  
**SCHEME OF EXAMINATIONS**  
**B.Sc Biochemistry 2023 – 2026 BATCH**

Semester	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
I	MIL - I	Tamil-I/Hindi-I / Malayalam – I/ French-I	3	4	-	-	25	75	100	3
	ELN - I	English-I	3	4	-	-	25	75	100	3
	DSC – I	Biomolecules	3	4	-	4	25	75	100	6
			3				25	75		
	DSC – II	Fundamentals of Cell Biology and Microbiology	3	4	-	4	25	75	100	6
			3				25	75		
	NMS - I	Soft Skills - I	3	2	-	-	Grade			
	NCC	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
LIB	Library	-	1	-	-	-	-	-	-	
<b>Total</b>					<b>28</b>				<b>400</b>	<b>18</b>
II	MIL-II	Tamil-II/Hindi-II/Malayalam – II/French-II	3	4	-	-	25	75	100	3
	ELN - II	English-II	3	4	-	-	25	75	100	3
	DSC – III	Human Physiology and Endocrinology	3	4	-	4	25	75	100	6
			6				25	75		
	DSC – IV	Bioinstrumentation Techniques	3	4	-	4	25	75	100	6
			6				25	75		
	NMS - II	Soft Skills - II	3	2	-	-	Grade			
	AECC – 1	Environmental Studies	3	1	-	-	100	-	100	1
	NCC	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
LIB	Library	-	1	-	-	-	-	-	-	
<b>Total</b>					<b>29</b>				<b>500</b>	<b>19</b>

Semester	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
III	MIL-III	Tamil-III/Hindi-III/Malayalam – III/French-III	3	4	-	-	25	75	100	3
	ELN - III	English-III	3	4	-	-	25	75	100	3
	DSC – V	Enzymology	3	4	-	4	25	75	100	6
			6				25	75		
	DSC – VI	Bioenergetics & Metabolism	3	4	-	4	25	75	100	6
			6				25	75		
	DSE - I	Elective- I	3	5	1	-	25	75	100	6
	NMS - III	Soft Skills - III	3	2	-	-	Grade			
NCC	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-	
<b>Total</b>					<b>33</b>				<b>500</b>	<b>24</b>
IV	MIL-IV	Tamil-IV/Hindi-V/Malayalam –IV/French-IV	3	4	-	-	25	75	100	3
	ELN - IV	English-IV	3	4	-	-	25	75	100	3
	DSC – VII	Clinical Biochemistry& Clinical Lab Technology	3	4	-	4	25	75	100	6
			6				25	75		
	DSC – VIII	Molecular Biology	3	4	-	4	25	75	100	6
			6				25	75		
	DSE - II	Elective – II	3	5	1	-	25	75	100	6
			3				25	75		
NMS-IV	Soft Skills - IV	3	2	-	-	Grade				
AECC –2	Aptitude	3	3			100	-	100	3	
NCC -G1	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	Good/ Satisfactory				

	<b>Total</b>	<b>36</b>		<b>600</b>	<b>27</b>
--	--------------	-----------	--	------------	-----------

Semester	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits	
V	DSC – IX	Genetic Engineering	3	4	-	4	25	75	100	6	
			6				25	75			
	DSC – X	Immunology	3	4	-	4	25	75	100	6	
			6				25	75			
	DSE-III	Elective-III	3	5	1	-	25	75	100	6	
	DSE – IV	Elective - IV (EDC)	3	5	1	-	25	75	100	6	
	<b>Any ONE Group</b>										
	<b>Group A</b>										
	SEC – G - A 1	Placement - College to Corporate I	3	2	-	-	50	-	50	2	
	SEC – G-A 2	Placement - College to Corporate II	3	2	-	-	50	-	50	2	
<b>Group B</b>											
SEC – G - B	Industrial Biochemistry	3	4	-	-	100	-	100	4		
<b>Total</b>						<b>32</b>			<b>500</b>	<b>28</b>	
VI	DSC – XI	Drug Biochemistry	3	4	-	4	25	75	100	6	
			6				25	75			
	DSC – XII	Plant Biochemistry	3	4	-	4	25	75	100	6	
			6				25	75			
	DSE- V	Elective-V	3	5	1	-	25	75	100	6	
	DSE – VI	Elective- VI	3		-	6	25	75	100	6	

	<b>TOTAL</b>	<b>28</b>		<b>400</b>	<b>24</b>
<b>I - VI</b>	ALCTA *( e-Learning in MOOC Platform)		Extra Credits		<b>4*</b>
<b>TOTAL</b>				<b>2900</b>	<b>140 + 4*</b>
					<b>144</b>

## ABBREVIATIONS

MIL	-	Multi Indian/ International Languages
ELN	-	English
DSC	-	Discipline Specific Courses
DSE	-	Discipline Specific Elective Courses
EDC	-	Extra Disciplinary Course
NMS	-	Naan Muthalvan Scheme
AECC	-	Ability Enhancement Compulsory Courses
SEC	-	Skill Enhancement Courses (Group A&B)
NCC	-	Non-Credit Course
ALCTA	-	Advanced Learner Course in Thrust Area

### **DSE I -Discipline Specific Elective Courses I: (III Semester)**

1. Allied Chemistry
2. Environmental Biochemistry

### **DSE II- Discipline Specific Elective Courses II: (IV Semester)**

1. Biostatistics
2. Marine Biochemistry

### **DSE III-Discipline Specific Elective Courses III: (V Semester)**

1. Clinical Data Analytics
2. Stem cells and cancerbiology

### **DSE IV- Discipline Specific Elective Courses IV (EDC): (V Semester)**

1. Extra Disciplinary Course (EDC) - List Enclosed

### **DSE V- Discipline Specific Elective Courses IV: (VI Semester)**

1. Recombinant DNA technology
2. Nutritional Biochemistry

### **DSE VI- Discipline Specific Elective Courses IV: (VI Semester)**

1. Project report-VIVA VOCE
2. Industrial Training



<b>DISCIPLINESPECIFICSELECTIVECOURSES(DSE)IV:(V-SEMESTER)</b>									
<b>DSE–IV-EXTRADISCIPLINARY COURSE:(EDC)</b>									
<b>Course</b>	<b>CourseName</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>CIA</b>	<b>ESE</b>	<b>Total</b>	<b>Credits</b>	
<b>OneCourse–FromtheGroup</b>									
B.A.English	ProfessionalCommunication	5	1	-	25	75	100	6	
BBA	Entrepreneurship	5	1	-	25	75	100	6	
BBA(CA)	ProjectManagement	5	1	-	25	75	100	6	
B.COM	InsuranceandRiskManagement	5	1	-	25	75	100	6	
B.COM(CA)	SocialMediaMarketing	5	1	-	25	75	100	6	
B.COM(IT)	E-Commerce	5	1	-	25	75	100	6	
B.COM(PA)	IndianTax System	5	1	-	25	75	100	6	
B.COM(BA)	Digitalmarketing	5	1	-	25	75	100	6	
BCA	ResponsiveWebDesign	5	1	-	25	75	100	6	
B.Sc.,(CS)	BusinessAnalytics	5	1	-	25	75	100	6	
B.Sc.,(IT)	BigDataEngineering	5	1	-	25	75	100	6	
B.Sc.,CSHM	HospitalityManagement	5	1	-	25	75	100	6	
B.Sc.,ECS	Fundamentalsof Digital Computers	5	1	-	25	75	100	6	
B.Sc.,MATHS	ComputationalMathematics	5	1	-	25	75	100	6	
B.Sc.,BC	HealthManagement	5	1	-	25	75	100	6	
B.Sc.,BT	ForensicScience	5	1	-	25	75	100	6	
B.Sc.,MB	Microbes–Health &Disease	5	1	-	25	75	100	6	
B.Sc.,N&D	Healthand LifeStyleDisorders	5	1	-	25	75	100	6	
BBALogistics	InternationalLogistics	5	1	-	25	75	100	6	
B.ScPsychology	StressandConflictManagement	5	1	-	25	75	100	6	
<b>Total</b>							<b>100</b>	<b>6</b>	

# SEMESTER-I

### SEMESTER - I

No	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
<b>I</b>	MIL – I	Tamil - I	3	4	-	-	25	75	100	3

### SEMESTER - I

Course Title : <b>TAMIL I ( T )</b>	Course Code : 11T
Semester : <b>I</b>	Course Group : <b>MIL-I</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : 3
Map Code: <b>A ( Language- Concepts)</b>	Total Contact Hours: <b>60</b>
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>ALL I UG PROGRAMMES</b> Semester End Exam	

No.	Course Outcomes (Cos): After completion of this course, the students will be able to	POs	CL. Ses	CL
CO1	பெரிய அளவுக்குரிய தமிழ் மொழியை அறிந்து கொள்ளும். அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும். அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும்.	PO4	14	U
CO2	பெரிய அளவுக்குரிய தமிழ் மொழியை அறிந்து கொள்ளும், அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும், அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும்.	PO7	15	U
CO3	பெரிய அளவுக்குரிய தமிழ் மொழியை அறிந்து கொள்ளும், அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும், அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும்.	PO8	12	U
CO4	பெரிய அளவுக்குரிய தமிழ் மொழியை அறிந்து கொள்ளும், அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும், அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும்.	PO2	9	AP
CO5	பெரிய அளவுக்குரிய தமிழ் மொழியை அறிந்து கொள்ளும், அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும், அது மூலமாக அனைத்து அம்சங்களையும் அறிந்துகொள்ளும்.	PO1	10	AP

பா - 1 பக்கங்கள்

பக்கங்கள் - 14 கண்ணன் என் தோழன்

- பாரதியார் (ஆசிரியர் குறிப்பு - உபாயம் உரைத்தலும் - கண்ணன் புகழும் - உற்ற மருந்தாவதும் - உள்ளன்பு கொள்ளலும் - மறைக்குக் குடையாதலும் பரிசீலனையில் உணவாதலும்).

தமிழ்ப்பேறு பாரதிதாசன் (ஆசிரியர் குறிப்பு - வாணம் ஓடை தாமரை பூக்கள் - ஓவியம் தீட்டுதல் பெண்கள் அன்பு செய்தல் - தமிழ்நாட்டு-மக்கள் நிலை இன்பத்தமிழ் கற்றல்).

எல்லாம் நானே கண்ணதாசன் (ஆசிரியர் குறிப்பு - நயம்பட்டு வழிதல் - கற்றது குறைவு - மனிதரை வையகம் போற்றும் - வாழ்க்கை ஏற்றம் - இறக்கம் ஆணவத்திற்கு அழிவே இல்லை

நியுட்டனின் மூன்றாம் விதி & நாயுத்துக்குமார் (ஆசிரியர் குறிப்பு - கேயாஸ்தியரி - நீர்த்த அமிலங்கள் - கட்டிள் பார்வை - செய்தித் தரர்களின் தற்கொலை நியுட்டனின் மூன்றாம் விதி).

கோடுகள் அப்துல் ரகுமான் (ஆசிரியர் குறிப்பு & கோடுகள் கிழித்தல் விளையாடுதல் பாம்புகளாகிகடித்தல் சங்கீதம் இல்லை மனிதம் விளைச்சல் இல்லை கோடுகளில் காயங்கள்

ஹைக்கூ கவிதைகள் - அறிவுமதி - ஆசிரியர் குறிப்பு - வாழ்த்து அட்டைபடம் - தூண்டில் காரன் வாழ்க்கை வண்ணத்துப்பூச்சி - இலவச மனைப்பட்டா நசங்கியது புல்லாங்குழல் கல்லூரி மணிக் கூண்டு).

அம்மா & சுகிர்தராணி (ஆசிரியர் குறிப்பு - உண்ணை அழைக்கிறேன் - பறவையாகி யறக்கிறேன் - குரல் ஒலிக்கிறது).

பா - II - பக்கங்கள்

பக்கங்கள் - 15

தமிழ் இலக்கியங்களில் கல்வியியல் சிந்தனைகள் - (ஆசிரியர் குறிப்பு - இளமையில் கல்வி கல்வியினால் வரும் பெருமை கல்லாமை ஒரு குற்றம் - கற்றித்தலும் கற்றலும் தலை மாணாக்கர் இடைய மாணாக்கர் கடை மாணாக்கர் இலக்கியங்களில் காணப்படும் கல்வி குறித்த சிந்தனைப் புதிவுகள்).

கீழடி - தமிழ்நாடு அரசு தொல்லியல்துறை வெளியீடு & தொல்லியலும் அதன் ஆய்வும் தமிழகத் தொல்லியல் துறையும் அறிஞர்களும் - கீழடியின் காலத்தொன்மை கட்டுமானப் பொருட்களின் பகுப்பாய்வு).

பெண்ணாக்கல் - (ஆசிரியர் குறிப்பு - விளையாட்டுப் பொருட்கள் - புழங்கு பொருட்கள் - நல்ல பெண்ணாக்கான குணநலன்கள் - வரையறைகள்).

தமிழக நாட்டுப்புறக் கலைகள் (நாட்டுப்புறக் கலைகளின் வகைகள் நாட்டுப்புற ஆப்பங்கள் தமிழகத்தில் கூத்துகளின் பிற பிரிவுகள் இசைக் கருவிகள் ஆடல் முறைகள் பாடல்கள் இடம்பெறல் நாட்டுப்புறக் கலைகளின் நலிவு).

அறிவும் ஈடிப்புமீ - (எல்லோருக்குமே சம உரிமை - கல்வியின் பொறுப்பு - கல்வியுடன் மதத்தைக் கலத்தல் - அறிவுவேறு - மதம்வேறு).

அ - III ஐயுடைய பகுதி - பகுதி

பகுதி - 12

கவிங்கத்துப்பராணி - ஜெயங்கொண்டார் (யானையும் கப்பலும் குதிரையும் குதிரைத் தறியும் - வீரர் முகமலர்ந்து கிடந்தமை - வீரர்களும் கருமிகளும் - வீரர் முகமலர்ந்து கிடந்தமை வீரர்களும் கருமிகளும்).

குற்றாலக் குறவஞ்சி - திரிசூடராசப்பக்கவிராயர் - (குறத்தி மலைவளம் கூறுதல் குறங்குகளின் விளையாட்டு - குறத்தி மலைவளம் கூறுதல் மலைகளின் வளமுரைத்தல் - குறத்தி மலைவளம் கூறுதல் குறங்குகளின் விளையாட்டு).

மதுரை மீனாட்சியம்மை பிள்ளைத்தமிழ் - குமர சூருபரர் - (சப்பாணிப்பருவும் அம்மையின் அருட்காட்சி - வருகைப்பருவும் - அன்னையடிவருகவருக என அழைத்தல்)

நாட்டுப்பறப்பாடல்கள் - தாலாட்டுப்பாட்டு - (குழந்தை தாலாட்டு - நித்திரை போதல் - கண்ணாப்பாட்டுதல் - குழந்தை அழுதல் - தொழிற்பாட்டு - தினை விதைத்தல் - தினைப்பிரைக்காத்தல் - தினைப்பிரைக் கொய்தல் தியை அடித்தல்)

அ - IV - பகுதி

பகுதி - 9

பெயரெச்சம் - வினையெச்சம் - (தெரிநிலைப்பெயரெச்சம் - குறிப்புப் பெயரெச்சம் - தெரிநிலை வினையெச்சம் - குறிப்பு வினையெச்சம்)

பண்புத்தொகை - குணம் - நிறம் - எண்ணம் - பண்பு - வினைத்தொகை - காலத்தை உணர்த்தும்).

வல்லினம் மிகும் இயங்கள் - (சூறிகெட்ட எதிர்மறைப் பெயரெச்சம் - சால - தவ முதலான உரிச்சொற்கள் - உம்மைத்தொகை - இரட்டைக்கிளிவி - அடுக்குத்தொடர் - வினா எழுத்துகள்).

அ - V - பகுதி

பகுதி - 10

புதுக்கவிதை - (மேனாட்டில் புதுக்கவிதை இயக்கச்சூழல் - தமிழகத்தில் புதுக்கவிதை சூழல் - மணிக்கொடிக்காலம் - எழுத்துக் காலம் - வாணம்புறத்தொடர் - அழகாலம்).

உரைநடை - (தொடக்க கால உரைநடை - உரைநடையின் வளர்ச்சி - கடின உரைநடை - செறிவான உரைநடை - இலக்கியத் திறனாய்வு நூல்கள் - பயண நூல்கள் - கடித இலக்கியம் - வாழ்க்கை வரலாறு - இலக்கியத் திறனாய்வு நூல்கள் - கடித இலக்கியம்).

பார்வை நூல்கள் :

1. தமிழிலக்கியவரலாறு - முடிவரதராசன்
2. கவிங்கத்துப்பராணி - ஜெயங்கொண்டார் - கழக வெளியீடு
3. குற்றாலக் குறவஞ்சி - திரிசூடராசப்பக்கவிராயர் - கழக வெளியீடு
4. மதுரை மீனாட்சியம்மை பிள்ளைத்தமிழ் - குமர சூருபரர் - கழக வெளியீடு
5. கொங்கு நாட்டுப்புற பாடல்கள் - கிருஷ்ணசாமி - நாம் தமிழர் பதிப்பகம்
6. நல்ல தமிழ் எழுதவேண்டுமா? - அ.கி. பரந்தாமன் - பாரி நிலையம்

	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
I	MIL – I	HINDI-I	3	4	-	-	25	75	100	3

### SEMESTER-I

Course Title : <b>HINDI – I (T)</b>	Course Code : 11H
Semester : <b>I</b>	Course Group : <b>MIL - I</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits 3
Map Code: <b>A ( Language- Concepts)</b>	Total Contact Hours: <b>60</b>
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>I YEARALL UG PROGRAMMES</b>	<b>Semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes	POs	CS	CL
CO1	Recognize the ancient valuable thoughts which insist in NEP-2020 through IKS system.	PO 7	15	U
CO2	Distinguish the importance and values of friendship which is very much needed of the hour.	PO7	12	AP
CO3	Practice the three important things in life which is very important in life	PO7	12	AP
CO4	Analyze the issues that cruel behavior with the animals is happen in the society can be eradicated.	PO4	12	AN
CO5	Criticize that the major family issues which is common is families and in the society.	PO8	9	E

**UNIT : I – GADHYA AUR KAHANIYAN****LECTURE HOURS: 15**

**Jeevan ki teen pradhanbaate : written by vinobhabave,** (what is the three important things in life. Why udhyog s importance. If udhyog is not there what will be the condition of the family. Through charka atleast one can get relief from the financial condition of the family. Bhakti is the second thing which is more important for the human being. Third thing in the life is what we learn in our live just teach the same to the others.)

**haar ki jeet :**(Author's introduction. Proud on his horse named sultaan since it is very attractive and run fast like anything. Dacoit who wanted to get that horse anyway. One fine day he visited bharathi's place and check out the horse for riding. Bharathi also innocently accepted for riding because people know about the horse which is pride for him. But the dacoit took away the horse from him. Bharathi felt very bad & he cried for the horse. One fine night he wake up from the sleep and went to shed where he find the horse. Conclusion.)

**UNIT : II - GADHYA AUR KAHANIYAN****LECTURE HOURS: 12**

**Prayashit:** (premchand, author's introduction. Subhodh Chandra and madarilaal is school mates, always grudge with subodh since he is a bright student in the school. Every teacher liked him. This was added fire in the thoughts of madari who is working in tax office. Subhod is promoted as a secretary and join the duty where madari is working. He planned to bring him down so he took away the rs.5000/- and the subodh did not have the condition to collect the money. He hanged himself he died. Madari really feel very after his demise. He took care of whole family of subodh and he atoned on his deeds).

**Gaura gai :**(mahadevivarma's introduction. She was touching her memory lane through gaura gai. She brought the cow from her sister shyama. Cow become very pet to mahadevi. Gaura become a mother of lalmani and it was pouring milk many liters. Sufficient milk given to other pets and neighbourychildren.still enormous milk was there. But the problem is for milking. Permanent solution is not there to milking because no man is ready. But author's old milk man is ready to do that work. Days are passed. One fine day gaura

become very sad and the milk also reduced. Veterinary doctor examined the cow and they told that there is a needle in the stomach, if it reached to heart gaura will die. Mahadevi enquired about this and the matter was the guala only did this because his income in the house by selling the milk. One fine day early morning gaura had its last breath. Mahadevi feels it very bad upon the tragic death of gaura. Aim and conclusion of the story).

#### **UNIT : III GADHYA AUR KAHANIYAN**

**LECTURE HOURS:12**

**Chaiwala:** (writer's introduction. One fellow return to India to see the country how it developed. He stayed in five star hotels and he rounds daily to the neighboring place. One day while he returning back he wants to drink a tea on roadside normal tea shop. There was no change for a big note. This fellow says no problem. Don't give the change just keep this as a tips. But the shopkeeper though he is a poor, he doesn't want to have the money which is not right to have that. Conclusion).

**Kadamb kephool:** (fight between daughter in law and mother in law. The reason is neighbor bring some kadamb flowers to bhabhi. Sas maa thought that there was a sweet brought for her and she alone eats all. This misunderstanding crossed the border and they both started fight. Gangaprasad came in the evening and he laughed after seeing the flowers).

**Shivaji ka sacchaswarup:** (The emperor who ruled the country was real Ramarajya, because Emperor Shivaji ruled the country in great manner which the history never fails to mention his name. one fine evening his peshwa returned to the kingdom after defeating the Ahmed's kingdom. As a gift they brought Ahmed's daughter in law to Shivaji. Peshwa's this work irritated to the king. King is ready to return the gift in a full honor. And he asked sorry to her on behalf of his peshwas. This could be a small incident but through this we can come to know about his respect towards ladies. Conclusion)

#### **UNIT : IV Grammar**

**(LECTURE HOURS:12)**

**Sangya, sarvanaam, karak, visheshan:** (Shabd hvichar: basic grammar knowledge will help the students to improve the language skills with sangya, sarvanaam, kriya, karak, visheshan, with sub topics).

#### **UNIT : V TRANSLATION.**

**LECTURE HOURS: 9**

**Hindi to English Translation.** (Teaching about the importance and art of translation)

#### **Text Books:**

1. PUSHP KUNJ COMPILED BY BOS HINDI.

#### **REFERENCE:**

1. MANAK HINDI VYAKARAN. VANI PRAKHASHAN, N.DELHI.
2. <http://premchand.co.in/story/prayashchit>.
3. <https://www.youtube.com/watch?v=sh68KY1X2RA>



	Course Opted	Course Name	D	L	T	P	CI A	ES E	Marks	Credits
I	MIL - I	Malayalam – I	3	4	-	-	25	75	100	3

### SEMESTER-I

Course Title : MALAYALAM – I (T)	Course Code : 11M
Semester I	Course Group : MIL-I
Teaching Scheme in Hrs (L:T:P) : 4:0:0	Credits : 3 Credits
Map Code: A (Language Concept)	Total Contact Hour : 60
CIA : 25 Marks	SEE : 75 Marks
Programme: I Yr ALL UG PROGRAMMES	
# - Semester End Exam	

No	Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	Class Session	CL
CO1	Report the deleterious effects of modern agriculture	PO4	12	U
CO2	Interpret that an entire landscape can be altered by the use of a single pesticide with lot of side effects	PO3	12	U
CO3	Organize situations which involve rehabilitation of people who has suffer for generation because of the deadly toxin-endosulfan	PO5	12	AN
CO4	Categorize literature with clear and scientific insights on such environmentally committed novels	PO4	12	AN
CO5	Adapt ethical and social values especially the way to handle vulnerable groups in our society	PO7	12	AP

**UNIT : I NOVEL**  
**AMBIKA SUDHAN MAANGHAD**

**LECTURE HOURS: 12 ENMAKAJE –**

( Ambika Sudhan was born in kasaragode. Professor in Nehru College, Mangad. Winner of lot of prestigious awards. A very touching novel and contemporary too. The novel describes the deleterious effects of use of a pesticide named 'endosulfan'. Devayani and Neelakandan lives together in a deep forest avoiding the contacts of rest of world. One fine morning Devayani found an unusual baby in the deep forest and brings to Neelakandan but he rejected the due to its unusual morphology. But Devayani decided to nurse the child inspite of his objection. The situations are progressing in an unpredictable way.)

**UNIT : II NOVEL**  
**AMBIKA SUDHAN MAANGHAD**

**LECTURE HOURS: 12 ENMAKAJE –**

(The sad part is that both of them strongly believe that the disease of the child is a result of curse from God. The mind set of both the characters is changed in the mid of the novel and they decided to come out of the forest of giving medical aid to the child. From the doctor they came to know that this disease is due to exposure of an endosulfan and it affects the animals around also. The ill effects of the pesticide are also scientifically challenged by the author in many crucial situations. From the doctor they came to know that this disease is due to exposure of an endosulfan and it affects the animals around also. The medical team was unable to save the child. The issue attracted the media attention. Jayarajan , social worker who took the matter and fought with the Government for the total ban of endosulfan. Due to interference of some rich farmers bureaucracy has tried its maximum to avoid the total ban of this hazardous chemical. At the end of the novel that good news is mentioned because Govt. of Kerala has decided for a total ban of this destructive pesticide.)

**UNIT III KHANDAKAVYAM**

**LECTURE HOURS: 12**

**SHISHYANUM MAKANUM – VALLATTHOLE NARAYANAMENON**

(Vallathole – an iconic modern poet. The relationship between guru and disciple is elucidated. The narration is done on a poetic way. The introduction of Ganapathy and Parasuraman is narrated. The issues between them is correlated with the contemporary problems in the present world. Their arguments and confrontations are well illustrated.)

**UNIT:IV KHANDAKAVYAM****LECTURE HOURS: 12****SHISHYANUM MAKANUM – VALLATTHOLE NARAYANAMENON**

(One of the best things about Vallathol. In this poem, the affection of a son and the affection of a disciple come together. In this poem, we see Lord Shiva, who swells with love for his son and disciple, and Parvati, who loves her son as life.)

**UNIT :V GRAMMAR****LECTURE HOURS: 12****TRANSLATION**

(The provided contents – two paragraphs to be translated with appropriate words. Their grammatical conversions shall be highlighted).

**TEXT BOOKS:**

- T1. Enmakaje - Ambikaasuthan Mangad
- T2. Shishyanum Makanum - Vallathole Narayana menon

**REFERENCE TEXTS:**

- R1. Malayalanoval Sahithyacharithram – KM Tharakan N B S Kottayam - 2000
- R2. Malayala kavithasahithyacharithram | Edition: 2 | D C Books | LeelavathiM-2001
- R3.Saahithyacharithra Prasthaananghaliloode – Dr. KM George, D C Books, Kottayam - 2004

<b>r</b>	<b>Course Opted</b>	<b>Course Name</b>	<b>D</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>CIA</b>	<b>ESE</b>	<b>Marks</b>	<b>Credits</b>
<b>I</b>	MIL-I	French-I	3	4	-	-	25	75	100	3

Course Title : <b>FRENCH-I (T)</b>	Course Code : <b>11 F</b>
Semester : <b>I</b>	Course Group : <b>MIL-I</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : <b>3</b>
Map Code : <b>A (Language Concept)</b>	Total Contact Hours : <b>60</b>
CIA : <b>25 Marks</b>	SEE# : <b>75 Marks</b>
Programme : <b>ALL I YR UG PROGRAMMES (Except CS&amp;HM) # - Semester End Exam</b>	

<b>No.</b>	<b>Course Outcome(Cos): After completion of this course, the students will be able to achieve the following outcomes.</b>	<b>POs</b>	<b>Class Session</b>	<b>CL</b>
CO1	Decouverte du francais, Premiers contacts, La langue de la classe. Demander de se presenter & se presenter, Demander/Donner des informations personnelles.	PO2	20	R
CO2	Demander/Dire le lieu d'habitation, Exprimer ses goûts, Parler de sa famille.	PO2	10	U
CO3	Faire des courses alimentaires, Donner une appreciation, Commander au restaurant.	PO4	10	AP
CO4	Presenter une ville/un quartier, Se deplacer en transports en commun, Demander/Indiquer le chemin.	PO4	10	AN
CO5	S'habiller, Donner une appreciation, Parler de la meteo, Decrire un objet.	PO7	10	C

**UNIT – 1: Bienvenue & Je suis... - (Lecture Hours: 20 Hrs)**

**Les Informations initiales** - (Alphabets, Phonetics, Salutations, Numbers, Days, Months, Seasons, Accents, Articles, Verbs, Conjugation, Adjectives, Time, General Questions.)

**Communication** - (Translation & Comprehension Passages)

**Grammaire** - (Grammar Exercises)

**Vocabulaire** - (Vocabulary Exercises)

**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 2: Pres de moi - (Lecture Hours: 10 Hrs)**

**Communication** - (Translation & Comprehension Passages)

**Grammaire** - (Grammar Exercises)

**Vocabulaire** - (Vocabulary Exercises)

**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 3: Qu'est-ce qu'on mange ? - (Lecture Hours: 10 Hrs)**

**Communication** - (Translation & Comprehension Passages)

**Grammaire** - (Grammar Exercises)

**Vocabulaire** - (Vocabulary Exercises)

**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 4: C'est ou ? - (Lecture Hours: 10 Hrs)**

**Communication** - (Translation & Comprehension Passages)

**Grammaire** - (Grammar Exercises)

**Vocabulaire** - (Vocabulary Exercises)

**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 5: C'est tendance ! - (Lecture Hours: 10 Hrs)**

**Communication** - (Translation & Comprehension Passages)

**Grammaire** - (Grammar Exercises)

**Vocabulaire** - (Vocabulary Exercises)

**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**Text Books:**

EDITO – NIVEAU A1- Methode de francais | Edition: 2 | Les Editions Didier | Caroline Sperandio | Lucie Mensdorff-Pouilly | Serguie Opatski | Violette Petitmengin | Sylvie Pons | Hamza Djimli (DELF) | Julie Veldeman-Abry (Phonétique) | (January, 2022)

**Reference Books:**

**R1.** Larousse – Dictionnaire bilingue | Edition: 2 | Hachette | MARIANNE DURAND (2006)

**R2.** Collins dico | Edition: 8 | MAURY-IMPRIMEUR SA MALESHERBES, FRANCE.

Harper co | MARIANNE DURAND (2006)

**Website Links:**

i) [wordreference.com](http://wordreference.com) ii) [verb2verbe.com](http://verb2verbe.com) iii) [tolearnfrench.com](http://tolearnfrench.com)

Course Title : English I (T)	Course Code :
Semester I	Course Group : ELN I
Teaching scheme in Hrs. (L: T:P): 4:0:0	Credits 3
Map Code : A (Language concept)	Total Contact Hours: 60
CIA : <b>25 Marks</b>	SEE : <b>75 Marks</b>
Programme : <b>All I UG Courses</b>	<b>#-Semester End Exam</b>

No.	Course Outcomes (Cos): After completion of this course, the students will be able to	PSOs	CL. Ses	CL
CO1	Develops Communicative Skills	PSO1	12	AP
CO2	Understand the basics of Grammatical Structures	PSO1	12	U
CO3	Classify and apply the verbs and tenses	PSO1	12	AN
CO4	Recall the units of language and the kinds of sentences	PSO1	12	R
CO5	Identify the different parts of speech	PSO1	12	R

## UNIT - I

## LECTURE HOURS:12

**The Lotus – Toru Dutt:** About the poet - Toru Dutt is one of the most famous Indo-Anglican poets - Most of her poetic works have an Indian theme and an Indian background - For an extended time, Lily and Rose had been fighting for the title 'Queen of flowers - Finally Love and Flora have decided to create a new flower that The Indian Lotus is the most beautiful and Queen of all flowers.

**Monday Morning – Mark Twain (Adapted from Adventures of Tom Sawyer):** Its an Adapted from "The Adventures of Tom Sawyer" by Mark Twain - Monday morning arises, and Tom is not so happy, because as usual, he has to go to school - He tries to find some reason to not go, like some ailment.

**Parts of Speech:** Definition of Noun, Pronoun, adjective- noun is a word used as the name of a person, place, thing etc, Definition of Verb and Adverbs - A verb is a word that denote an action. Definition of preposition, conjunction and interjection - A preposition is a word that is used with a suffix.

**Hints Development:** Read all the hints thoroughly - Try to understand the tone of the passage. Make sure to use all the hints; do not leave any point - Arrange the points sequentially, one leading to the other - Make two or three paragraphs, as required - Look for the tense in the hints, follow the same in the story.

## UNIT - II

## LECTURE HOURS:12

**Goodbye Party to Miss. Pushpa T.S - Nizzim Ezekiel:** Nissim Ezekiel in this poem narrates an incident when a woman (Miss Pushpa) is supposed to leave India - her colleagues have masterminded a "Goodbye Party" for her - The narrator is likely a man uses Babu English which is quite interesting as he uses the Hindustani dialect and manners in it.

**A Day's Wait – Ernest Hemingway:** It refers to the boy's day spent waiting to die, as he believes he will - The father narrates the story - doesn't realise that boy believes he is approaching imminent death - simply ascribes his son's strange behaviour to the illness.

**Tense:** Definition of Tenses – 12 basic English tenses - Types of tenses – Rules for Tenses

with Examples. Sentence Pattern: Definition and Examples – Five Essential Elements of the sentence – Subject – Verb – Types of Verbs – Object – Complement – Adjunct – Examples. Gerunds and Infinitives: Introduction about Gerunds and Infinitives - Basic Rules for Gerunds and Infinitives.

### UNIT - III

**LECTURE HOURS:12**

**Incident of the French Camp – Robert Browning:** The poem describes an act of chivalry, gallantry, patriotism and sacrifice on the part of a young French soldier - It narrates an actual event in the war between France and Austria led by Napoleon in 1809 - Napoleon was standing on a little mound, eagerly looking towards Ratisbon.

**I Have a Dream – Martin Luther King:** It's a speech – given by Martin Luther King – In his speech minister and civil rights activist Martin Luther King Jr. outlines the long history of racial injustice in America and encourages his audience to hold their country accountable to its own founding promises of freedom, justice, and equality.

**Concord:** Introduction about Concord – Rules and Types of Concord – Exercises and examples.

**Comparison of Adjectives:** Introduction to the Degree of Comparison - Types of Degree of Comparison - Positive, Comparative and Superlative - Importance, Usage, Examples.

### UNIT - IV

**LECTURE HOURS:12**

**Daffodils – William Wordsworth:** The poem was composed in the year 1802 - The title of the poem informs about the loneliness of the poet which he faces after the death of his brother - the endless view of the golden Daffodils in a field across the lake filled him with joy - This view was the greatest gift of nature to him.

**The Unexpected – Robert Lynd:** The essay “Unexpected” is the one which lets everyone to appreciate nature for the beauty which it shows us beyond our expectations - Lynd is trying to take us towards the natural beauty by taking the example of the wild birds and their singing ability which takes you to the imaginary world.

**Conditional Clauses:** Conditional clause definition - four main kinds of conditionals - The Zero Conditional (if + present simple, ... present simple) - The First Conditional (if + present simple, ... will + infinitive) - The Second Conditional (if + past simple, ... would + infinitive) - The Third Conditional (if + past perfect, ... would + have + past participle).

**Re-Arranging Jumbled Sentences:** Finding the opening sentence – Finding the closing sentence – Finding the connection between them – Finding the central theme of the sentence.

### UNIT - V

**LECTURE HOURS:12**

**Stopping by Woods on a Snowy Evening – Robert Frost:** The story of a writer passing by some woods - The writer of the poem is traveling in the dark through the snow - pauses with his horse near the woods by a neighbour's house to observe the snow falling around him.

**My Lord, The Baby – Rabindranath Tagore:** It begins with a twelve-year-old boy named Raicharan - He leaves his village and enters the home and service of a man who shares the same caste as Raicharan – He

becomes the private servant - From birth up until the day that the boy leaves for college - he is Anukul's personal attendant.

**Reported Speech:** Introduction to the Direct Speech and Indirect Speech - Changing Time Expressions - the difference between Direct and Reported Speech - Direct and Indirect Speech Rules with Examples.

**Text Books:**

T1. Natarajan K. *Enlightening English Prose*. New Century Book House, 2011.

T2. Rathnasabapathi K. *Developing Language Skills through Literature -I*. Sunitha Printers, 2016.

T3. Robb, Cuthbert W. *Representative Anthology: English Essays*. Blacky Books, 2011.

**Reference Books:**

R1. Mohan, Krishna and Banerjee, Meena. *Developing Communication Skills*. Macmillan India, 1990.



Course Title	: <b>BIOMOLECULES</b>	Course Code	: 13A
Semester	: <b>I</b>	Course Group	: <b>DSC-I</b>
Teaching Scheme in Hrs (L:T:P)	: <b>4:0:0</b>	Credits	: <b>4 Credits</b>
Map Code	: <b>C(THEORY CONCEPTS)</b>	Total Contact Hours	60
CIA	: <b>25 Marks</b>	SEE	: <b>75 Marks</b>
Programme: <b>BSC-BC</b>			

**Course outcome: (Cos)**

No.	Course Outcome (Cos): After completion of this course, the students will be able to	POs & PSOs	Cl. Ses	CL
CO1	Interpret structure, function of water and relate structure of monosaccharides, disaccharides and polysaccharides	PSO 1	12	U
CO2	Rephrase and relate structure and properties of different types of lipids and steroids	PSO 2	12	U
CO3	Summarize different type of amino acids, chemical structures of proteins and summarize the unique characteristics of proteins	PSO 2	6	U
CO4	Illustrate the components of nucleotide and analyse the structure and functions of two types of nucleic acids DNA and RNA	PSO3	12	Ap
CO5	Explain the role of common vitamins and minerals in normal physiology and disease	PSO 3	12	Ap

### **UNIT-1 (Lecture hours: 12)**

Introduction - Structure of water

Physical properties of water - Hydrogen bonding of water, solvent properties of water, hydrophobic interactions.

Carbohydrates - Introduction (Definition & Classification), Types of Monosaccharides (Introduction & Classification, Cyclic structure & Anomeric forms Haworth projection formula), Disaccharides (Introduction & Classification, structure & functions of Sucrose, maltose & lactose), Polysaccharides (Introduction & Classification), Starch & Glycogen (Structure & Function), Structural polysaccharide (Structure & Function).

### **UNIT-2 (Lecture hours: 12)**

Lipids – Introduction (Definition & Classification), Simple lipids (Fats, oils & waxes. Physical properties - Solubility, specific gravity, melting point, color & odor), Chemical properties of

Fats (Hydrolysis, Saponification Number, Iodine Number, RM value, Acid Number and Rancidity of fats), Compound lipids (Structure & functions of Phospholipids, Glycolipids and Lipoproteins), Derived lipids (Saturated, Unsaturated fatty acids) Sterols and Steroids (Cholesterol and its structure)

### **UNIT-3 (Lecture hours: 12)**

Amino acid- Introduction (Definition & structure), Classification (Based on functional groups, amino acids as ampholytes), Aliphatic Amino acids (Structure and properties), Aromatic amino acids ( Structure and properties),Peptide bond (Structure & properties),Identification( N&C terminal residues)

Protein - Introduction (Classification & properties), Structure of proteins (Primary, secondary, tertiary & Quaternary structures), Denaturation & Renaturation of proteins (Physical & chemical agents, coagulation, refolding)

### **UNIT-4 (Lecture hours: 12)**

Nucleic acids - Introduction (Definition & Types), Purines (Structure of Adenine, Guanine, Xanthine & Hypoxanthine), Pyrimidines ( Structure of Thymine, Uracil & Cytosine),Nucleosides & nucleotides (Structure),DNA (DNA double helix - Watson & Crick model, Chargaff's rule),Types( A, B & Z forms),Denaturation & Renaturation (Effect of pH & temperature on DNA), RNA - Types (mRNA, rRNA, tRNA, -Structures and their biological roles)

### **UNIT-5 (Lecture hours: 12)**

Vitamins Introduction - Definition &classification.

Fat soluble vitamins - Sources & physiological functions of vitamin A, D, E, K.

Water soluble vitamins - Sources & physiological functions of vitamin B complex and vitamin C Vitamin deficiency - Deficiency symptoms of vitamins.

Minerals Introduction - Definition &classification. Mineral requirement.

Essential macro minerals - Sources & functions of calcium, chloride, magnesium, phosphorus, Potassium,

sodium & sulphur.

Essential micro minerals - Sources & functions of boron, chromium, cobalt, copper, iodine, iron, manganese, molybdenum and zinc.

**Text Books :**

**T1.** Biochemistry | Edition:5 | W.H. Freeman & Company, New York | LUBERT STRYER(2015)

**T2.** Essentials of Biochemistry | Edition:2 | Books and Allied (P) Ltd | U.CHAKRAPANI AND U.SATHYANARAYANA (2016)

**T3.** Fundamentals of Biochemistry | Edition:II | S.Chand & Company | JAIN.J.L(2015)

**Reference Books :**

**R1.** Fundamentals of Biochemistry | Edition:1 | John Wiley & Sons Inc USA | DONALD VOET AND JUDITH G. VOET(2014)

**R2.** Lehninger Principles of Biochemistry | Edition:3 | Macmillan Worth Publishers USA | DAVID.L NELSON AND MICHAEL.M.COX(20)

Course Title	: <b>BIOMOLECULES (P)</b>	Course Code	: 13P
Semester	: <b>I</b>	Course Group	: <b>DSC-I</b>
Teaching Scheme in Hrs (L:T:P)	: <b>0:0: 4</b>	Credits	<b>4</b>
Map Code	: <b>H(PRACTICAL EXPERIMENTS)</b>	Total Contact Hours	60
CIA	: <b>25 Marks</b>	SEE	: <b>75 Marks</b>
Programme: <b>BSC-BC</b>			

List of

**Experiments:**

1. Qualitative Analysis of Monosaccharides- Glucose and Fructose
2. Qualitative Analysis of Disaccharides - Sucrose and Maltose
3. Qualitative Analysis of Polysaccharides - Starch and Dextrin
4. Determination of Acid number of edible oil.
5. Determination of saponification number of edible oil
6. Estimation of unsaturated fat by iodine value of oil.
7. Qualitative Analysis of Non-polar, Aliphatic Aminoacids- Methionine, Leucine
8. Qualitative Analysis of Aromatic Aminoacids- Tyrosine, Tryptophan
9. Qualitative Analysis of Polar, Uncharged Aminoacid- Serine
10. Qualitative Analysis of Charged Aminoacid- Histidine
11. Identification of protein by Biuret method
12. Denaturation of protein using Egg
13. Isolation of protein from different organic sources
14. Quantify the amount of casein present in milk samples
15. Isolation & Purification of DNA

Course Title	: <b>Fundamentals of Cell Biology and Microbiology</b>	Course Code	: 13B
Semester	: <b>I</b>	Course Group	: <b>DSC-II</b>
Teaching Scheme in Hrs (L:T:P)	: <b>4:0:0</b>	Credits	: <b>4 Credits</b>
Map Code	: <b>C(THEORY CONCEPTS)</b>	Total Contact Hours	60
CIA	: <b>25 Marks</b>	SEE	: <b>75 Marks</b>
Programme: <b>BSC-BC</b>			

**Course outcome: (Cos)**

S.No.	Course Outcome (Cos): After completion of this course, the students will be able to	Pos & PSOs	Cl. Ses	CL
CO1	Discuss the model of a cell and the process of phagocytosis	PSO1	12	R
CO2	Describe and understand the cell fractionation and identification of cell	PSO1	12	U
CO3	State the morphology, cultural characteristics, Antigenicity, Pathogenesis, Clinical symptoms, Laboratory diagnosis, Prevention and Treatment of Gram-positive microorganism	PSO1	12	U
CO4	Define morphology, Pathogenesis, Clinical symptoms, Laboratory diagnosis, Prevention and Treatment of representative viruses	PSO1	12	U
CO5	Establishing the unique mechanism of existing	PSO3	6	Ap

## **UNIT - 1 (LECTURE HOURS: 12)**

Cell biology : Cell membrane - (Introduction, Structure and functions- Fluid mosaic model, Unit membrane model), Membrane transport- (Active and Passive transport-Endocytosis and Exocytosis-Pinocytosis and Phagocytosis), Cell structure - (cytoplasm -structure – composition), Cellular organelles - ( Nucleus- Mitochondria-Golgi bodies-Lysosomes- Endoplasmic reticulum-Peroxisomes-Plastids- Vacuoles- Ribosomes), Cytoskeleton - (structure and function)

## **UNIT - 2 (LECTURE HOURS: 12)**

**Cell division and cell growth** : Cell division - (Mitosis and Meiosis ,reductive division), Cell cycle- (Phases of cell cycle -cell cycle regulation, cell cycle check points).

**Microscopic**-Principles of Light microscopy; Phase contrast microscopy; Confocal microscopy; Electron microscopy (EM)- scanning EM and scanning transmission, Fluorescence microscopy

## **UNIT - 3 (LECTURE HOURS: 12)**

### **Bacteriology -gram positive bacteria**

Staphylococcus aureus, Streptococcus pyogenes, Corynebacterium diphtheria, Clostridium tetani, Bacillus anthracis, Mycobacterium tuberculosis (Morphology, cultural characteristics, antigenicity, pathogenesis, clinical symptoms, laboratory diagnosis, prevention and treatment). **Bacteriology - gram negative bacteria**

Escherichia coli, Klebsiella pneumonia, Salmonella typhi, Shigella species, Vibrio cholerae, Pseudomonas species (Morphology, cultural characteristics, antigenicity, pathogenesis, clinical symptoms, laboratory diagnosis, prevention and treatment).

## **UNIT - 4 (LECTURE HOURS: 12)**

### **Virology**

Hepatitis virus, Rabies virus, Influenza virus, Mumps, Polio virus, Measles virus (Morphology, pathogenesis, clinical symptoms, laboratory diagnosis, prevention and treatment).

### **Plant viruses**

Tobacco mosaic virus, Bunchy top of banana, Satellite viruses, Viroid, Double stranded DNA viruses, Assay methods (Morphology, pathogenesis, symptoms, transmission and lab diagnosis).

### **Animal viruses**

Prions, Rinder pest, Blue tongue, Raniket Dion, Foot and mouth disease Oncogenic virus-Papilloma virus (Morphology, pathogenesis, symptoms, transmission and lab diagnosis). Antiviral agents - Action and mechanism of antiviral drug)

## **UNIT - 5 (LECTURE HOURS: 12)**

**Fungi General characteristics of fungi** - Distribution, importance, structure, nutrition and metabolism.

Characteristics of fungal division- Zygomycota – charecteristics structure properties and application.

Ascomycota - structure properties and application. Basidiomycota - charecteristics structure properties and application. Slime molds and water molds - Reproduction and life cycle. Yeast life cycle - Phases in the cycle.

### **Protozoa**

General characters of protozoa, classification and representative types - Sarcomastigophora, Apicomplexa, Microspora, Ciliophora. Algae- General characteristics of algal division - Chlorophyta, Euglenophyta, Chrysophyta, Phaeophyta, Rhodophyta, Pyrrophyta.communications)

Text Books :

**T1:** Cell and Molecular Biology | Edition:8 | Lippincott Williams and Wilkins, Philadelphia | De Robertis, E.D.P. AND T2: De Robertis, E.M.F. (2010) The Cell: A Molecular Approach | Edition:5 | Sunderland, Mass. Sinauer Associates, Inc. | Cooper, G.M AND Hausman, R.E(2009)

**T2:** Karp's Cell and Molecular Biology: Concepts and Experiments anet Iwasa, Wallace marshall. Publication: John Wiley & Sons Inc; Edition: 8 edition (29 December 2015)

**T3: The Cell: A Molecular Approach** –Geoffrey M. Cooper, Robert E. Hausman Publication: Sinauer Associates Inc; Edition: 6 edition (1 February 2013)

**T4:** De Robertis, E.D.P. and De Robertis, E.M.F. (2006). Cell and Molecular Biology.VIII Edition. Lippincott Williams and Wilkins, Philadelphia.

**T5:** Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. V Edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.

**T6:** Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. (2009). The World of the Cell. VII Edition. Pearson Benjamin Cummings Publishing, San Fr

**Reference Books :**

**R1:** Cell and Molecular Biology: Concepts and Experiments | Edition:6 | John | Karp, G(2010) **R2:** Essential Cell Biology | Edition:4 | Garland Science | Bruce Alberts AND Dennis Bray (2013)

Course Title : <b>Fundamentals of Cell Biology and Microbiology (P)</b>	Course Code : 13Q
Semester : <b>I</b>	Course Group : <b>DSC-II</b>
Teaching Scheme in Hrs (L:T:P) : <b>0:0:4</b>	Credits <b>4</b>
Map Code : H (PRACTICAL - EXPERIMENTS)	Total Contact Hours <b>60</b>
CIA : <b>25 Marks</b>	SEE : <b>75 Marks</b>
Programme: <b>BSC-BC</b>	

### List of Experiments

1. Microscopic view of prokaryotic cells using staining techniques. - Simple staining
2. Microscopic view of prokaryotic cells using staining techniques - Gram staining
3. Mitotic cell division by using - onion root tip
4. Separation of nucleic acid bases - By paper chromatography.
5. Preparation of cell culture media
6. Cellular Organelles separation by using centrifugation technique.
7. Isolation and enumeration of Bacteria from soil
8. Isolation and enumeration of Fungi from bread
9. Isolation and identification of photosynthetic algae Spirulina

# SEMESTER-II



	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
<b>II</b>	MIL – II	Tamil– II	3	4	-	-	25	75	100	3

Course Title : <b>TAMIL - II (T)</b>	Course Code : <b>21T</b>
Semester : <b>II</b>	Course Group : <b>MIL- II</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : <b>3</b>
Map Code: <b>A ( Language- Concepts)</b>	Total Contact Hours: <b>60</b>
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>ALL I YEAR UG PROGRAMMES</b> <span style="float: right;"><b>Semester End Exam</b></span>	

No.	Course Outcomes (Cos): After completion of this course, the students will be able to	POs	CL Ses	CL
CO1	தமிழ் மொழியின் அமைப்பு, அங்கம் அமைப்பு, ஓர் அங்கத்தின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு.	PO7,	13	U
CO2	தமிழ் மொழியின் அமைப்பு, அங்கம் அமைப்பு, ஓர் அங்கத்தின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு.	PO7	12	U
CO3	தமிழ் மொழியின் அமைப்பு, அங்கம் அமைப்பு, ஓர் அங்கத்தின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு.	PO3	15	R
CO4	தமிழ் மொழியின் அமைப்பு, அங்கம் அமைப்பு, ஓர் அங்கத்தின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு.	PO2	9	U
CO5	தமிழ் மொழியின் அமைப்பு, அங்கம் அமைப்பு, ஓர் அங்கத்தின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு, அங்கங்களின் அமைப்பு.	PO1	9	U

திருக்குறள் - (வாள்சிறப்பு - மழையின் பெருமை - மழை உணவாதல் - மழை இல்லாவிட்டால் பசித்துண்பம் மிகும் - கெடுப்பதும் கொடுப்பதும் மழை - மழை இன்றிக் கடலும் வற்றுந் - தாழமும் தவழும் மழையின்றிக் கெடும் - நீரின் அவசியம்) திருக்குறள் - (இறைமாட்சி அரசனதுபுகழ் - படைபுகழ் - பெரளர் - அமைச்சர் - நட்பு - இயற்றல் - சூட்பல் - காத்தல் இறைமாட்சி - காட்சிக்கு ஏழியவன் - அன்பாக பேசுதல் - மன்னவனை இறைவுளாகப் போற்றுதல் - செங்; கொல்.)

நாலடியார் - (நாலடியார் பாடல்கள் - சிறப்புகள் - அறக்கருத்துகள் உணர்த்துதல் - இளமை நிலையில்லாதது - காம மயக்கத்தால் உடல் குன்றுதல் - இளமை நீங்கி முதுமை அடைதல் - கல்விபின் சிறப்பு - கற்பவாநாள் சில - கல்விக்கு கரையில் - பலரோடு சேர்த்து உண்ண வேண்டும் - செல்வம் யாரிடமும் தங்காது - எந்நிலத்து வித்திழனும் - எட்டி மரத்தின் காய் தென்னை ஆகாது - அறத்தின் வழியே சொர்க்கம் செல்லலாடியும்.)

சிறுபஞ்சமூலம் : (சிறுபஞ்சமூலம் அறிமுகம் - சிறுபஞ்சமூலம் பாடல்கள் சிறப்புகள் - அறக்கருத்துகள் உணர்த்துதல் - பழிழை பொறுத்தல் - சிறுமை தீங்கெண்ணிபுரிருத்தல் - நகைகெட வாழ்வதும் நன்று - பூக்காது காங்கும் மரம் உள - விதையாமை நூறுவநீர் அறடி நன்று - பார் அறம் நன்று - சாலை நட்டல் நன்று.)  
பழமொழி நானூறு - (கள்ளி - அகிலும் கருக்காக்ககையும் உள்ள வேண்டாம் - அறிவு அன்று - அழகு அன்று - சிறியர் எனப்படுவர் - கண்ணுள் மணியே போல் காதலராக நட்டவர் - உண்பவரைக் காப்பது கூற்று - மாரி வளம் குன்றியது - பாண்மகள் நிலைப்பாடு - மாமுன்றில் நிலை)

**அலகு II - மக்தி இலக்கியங்கள்**

□□□□□□□□ a - 12

1. திருவாசகம் - பக்தி இலக்கியம் = (பன்னிரு திருமுறைகள் - எட்டாம் திருமுறை - திருச்சத்தம் பதிகச்சிறப்பு - அடியார் நிலை - திருவாடிச்சிறப்பு - வேறு தெய்வங்களை நினையாதிருத்தல் - பலசொற்களை யேசுவும் அடியார் பேசுதல் - மலர்களால் அர்ச்சித்தல் - செல்வத்தை பெறவில்லை - அடியார்களின் துயர்களைத் துறந்து திருவடி இன்பம் சூழ்ந்துதல்) - மெய்யுணர்தல்)
2. பொய்கையாழ்வார் யாசகம் - நாலாயிரதிவ்யப் பிரபந்தம் = (முதலாழ்வார்கள் - முதல் திருவந்தாதி - உலகப்பொதுமை வேண்டல் - திரவடி மாலை சூட்டல் - உலகை உமிழ்ந்தவன் - ஐந்து பொறிவாசல் நின்றவன் - காட்சிக்கு எளியவன் - அன்பாக பேசுதல்; - மன்னவனை இறைவனாகப் போற்றுதல்;)
3. மெய்ப்பெருள் நாயனார் யாரணம் (மலாடர் கோமான் - அன்பர்கருத்து அறிந்து ஏவல் செய்பவர்; - அன்பர் வேடமே சிந்தை செய்பவர் - கோயில்களில் இடைவிடாது வழிபாடு செய்பவர் - செல்வங்களை திருக்கோயில்களுக்கு வாரி வழங்கியவர் - நாயனாரை வெல்ல மாற்று அரசன்புருதல் - அடியார் தோற்றமே அரண் என நம்பியவர் - முத்தநாதன் பொய்யாடிவேடத்தில் வருதல் - தத்தன் தடுத்து நிறுத்தல் - அரண்மனையில் புகதல - முத்தநாதன் வஞ்சக மொழி உரைத்தல் - அரசியை தனியிடம் போக செய்தல் - முத்தநாதனின் வஞ்சக எண்ணம் பழித்தல் நாயனாரை வாளினால் கீழ்த்தல் - முத்தநாதனிடம் தத்தா நமர் எனல் - முத்தநாதனை காட்டில் விடச் செய்தல் - திருநீற்று அன்பு பாதுகாத்தல் - இறைவன் திருவடி நிழல் அடைதல்)
4. பிறசமயங்கள் - பராபரக்கண்ணி - (திருக்கூத்தினை கண்டு மகிழ்தல் - வேத மறைப்பொருளை உணர்தல் நாதர்ந்தப் பொருளை அறிதல் - பராபரத்தை வேண்டுதல்)
5. இயேசுநாதர் சரிதை - (மணிவயிற்று உதித்த வள்ளல் - அகலும் புறமும் நிறைந்தவன் - கருணையின் அன்னையிடம் அன்னை மரியாளின் அன்பு - ஆண்டவன்கருவளர்தல் - அகந்தை வீற்றல்)

**அலகு III - சிறுகதைகள்**

□□□□□□□□ a - 15

1. நீர் விளையாட்டு - பெருமூள் முருகன் - (கிணறு - தோற்றம் - கிணற்றில் குதித்தல் - கிணற்றை முந்தையாக பார்த்தல் சிறுமியின் செயல் - நீர் விளையாட்டு மறுத்தல் - அச்சத்தை விடுவித்தல் - கிணற்றின் ஆழத்திற்கு செல்லல் - கைகள் நீந்திக் கொண்டு நுந்தன - தவளையாய் நீந்தினான்.)
2. காபர் குடி - வே. பிரசாந்த் - (பழங்குடிமக்கள் - குடில்கள் அமைத்தல் - காபர் குடி செட்டில் மெண்டம் மையாடி - குடியிருப்பு பாதிப்பு - ரேஞ்சரின் கோபம் - ஒன்றிய அரசின் திட்டம் மூப்பலும் - ரவியும் காடு வாழ்விடம் எனல் - மீண்டும் திரும்புதல்);
3. கீடு - காஞ்சனாதாமோதரன் - (முற்றத்தில் பல்வகையான நிகழ்வுகள் - திண்ணைகள் தொழில்க்கட்டு - பழமையான கீடு - வீட்டின் அறைகள் - பேச்சியின் பிதற்றல் - கூட்டுக்குடும்ப வாழ்க்கை - கிணற்றுப்பக்கம் - புளியமரம் - குருவிகள் நிலை - பாட்டி பெரியம்மா - கீட்டின் பழமை.) - குழந்தைகள் நிலை - பசியின் கொடுமை -
4. (இருவர்கண்டு ஒரே கனவு - கு. அழகிரிசாமி - வெள்ளப்பெருள் - குழந்தைகளின் கனவு - வெள்ளையம்மாள் வேலப்பனின் கருணையுள்ளம் - வெள்ளையம்மாள் மரணம் - மரணம் - வேலப்பன் அவனைத்தல் - குழந்தைகளின் கனவு.)

5. நிழலும் நிஜமும் - (மதுரைப் பயணம் - ஆசிரியயப்பணி - கிறிஸ்துமஸ்க்கு குணிகுடுத்தல் - உணவு அருந்துதல் - சிக்கனமாக செலவு - பலவித சிந்தனை - தின்பண்டம் வாங்குதல் - நிஜமும் - ஹோட்டலில் உணவு அருந்துதல் - சிறுவனின் உறுமை - சிறுவனுக்குக் காசு கொடுத்தல் - சட்டையடித்தல் - நிகழ்வு - சிறுவனின் பார்வை - சிறுவனின் ஈகைப்பண்பு.)
6. இரணியவதம் - (சின்னக்கருப்பு வாத்தியார் - ராஜாராமன் - இரணியவதம் கூத்து பயிலுதல் - தழக்கம் மைதானத்தில் கூத்து - நாடகம் புத்துயிர் பெறுதல் - பைம் ஆப் இந்தியா ஆக்கூர் - பக்கிரியிடம் புலிநகம் வாங்கி செல்லல் - புலிநகம் வாங்கி வருதல் - சின்னக்கருப்புவால் பாப்பாவிற்று ஏற்படும் சிக்கல் - ராஜாராமனின் இரணிய வதம்)

**அலகு IV - விண்ணம்பம் கலைச்சொற்கள்**

○○○○○○○○a - 09

கடிதம் எழுதுதல் கடிதப்பயிற்சி - (அலுவலகக் கடிதம் - அரசு அலுவலகங்கள் - வேலைவாழ்ப்புகடிதங்கள்; - அரசு அலுவலகங்கள் - கருத்தரங்கம் நடத்த வேண்டி விண்ணப்பித்தல்;)

விண்ணப்பம் எழுதுதல் - (கல்விக்கடன் - முதல்பட்டதாரி - புத்தகங்கள் வேண்டி விண்ணப்பம் எழுதுதல். - கணிப்பொறியில் கலைச் சொற்கள்)

துறைதேறும் கலைச்சொற்கள் - (மருத்துவம் - வேளாண்மை - சட்டம் - பொறியியல்; தொழில் நுட்பம் - ஆட்சிச்சொல்.)

**அலகு V - இலக்கிய வரலாறு**

○○○○○○○○a - 09

அற இலக்கியங்கள் (பதினெண் கீழ்க்கணக்கு நூல்கள் - திருக்குறள் நாலடியார் சிறப்புகள் - அற இலக்கியங்கள் - அற இலக்கியங்கின்பயன் - அகநூல்கள் - புற நூல்கள் - அகப்புற நூல்கள் - தோற்றம் வளர்ச்சி.)

பக்தி இலக்கியங்களின் தோற்றமும் வளர்ச்சியும் - (சைவம் - பன்னிரு திருமுறைகள் - தேவாரம் - திருவாசகம் - திருமந்திரம் - பெரியபுராணம் - அமயக்குரவர்களின் சிறப்பு - வைணவ இலக்கியம் - நாலாயிர திவ்விய பிரபந்தம் - ஆழ்வார்களின் சிறப்பு.)

சிறுகதையின் தோற்றமும் வளர்ச்சியும் -- (சிறுகதை விளக்கம் - சிறுகதை சூழல் - சிறுகதை அமைப்பு - சிறுகதை எழுத்தாளர்கள் - பிச்சுமர்த்தி - புதுமைப்பித்தன் - அழகிரிசாமிமுதலியோர் - சிறுகதை தோற்றமும் வளர்ச்சியும்.)

பார்வை நூல்கள் :

1. தமிழிலக்கிய வரலாறு - மு. வரதராசன்
2. திருக்குறள் - கழக வெளியீடு
3. நாலடியார் - கழக வெளியீடு
4. திருவாசகம் - கழக வெளியீடு
5. நல்ல தமிழ் எழுதவேண்டுமா? - அ.கி. பரந்தாமன் - பாரி நிலையம்

Sl. No.	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
	II	MIL - II	HINDI -II	3	4	-	-	25	75	100

**SEMESTER-II**

Course Title : <b>HINDI - II (T)</b>	Course Code : 21H
Semester : <b>II</b>	Course Group : MIL - II
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : 3

Map Code: <b>A ( Language- Concepts)</b>	Total Contact Hours: <b>60</b>
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>ALL I YEAR UG PROGRAMMES</b>	<b>Semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	CS	C L
CO1	Recognize the ancient valuable thoughts through which is contemporary even day today's life now also.	PO7	15	U
CO2	Distinguish the importance and values of the nature and its credibility to the environmental basis.	PO3	15	R
CO3	Implement the issues which human carried out is in the wrong perception. Adopt ourselves to the situation is important.	PO7	15	AP
CO4	Distinguish the issues handled the problems day to day life in middle class family.	PO8	8	AN
CO5	Knowing & applying more grammar in every walk of life.	PO1	7	AP

### UNIT : I – KABIR KE DOHE (LECTURE HOURS: 15)

KABIR KE DOHE: (samaj ke pratikabir ki vani , samaj me sadhuvonkeprati kalian ki bhavana, jyadalalach ki bhavana se dur rehne ki maangishwar se kartehaia, jitnimehnat hum karengutna hi phal pavengeuskesiddhant ko yuvyaktartehai, ninakon ko paasrakhne ki salaah detehai, unkivajah se hum nirmal ho jayengebinasabuntathapanike, manushyon ki jindagi bahut kumsamaykeliey, I hai, usme hum acchekarmon se duniya ka prem jitnahai, atmaparamatmake Milan ki baatkartehai, jaisejal me kumbkumb me jalkebarabarathamparamatmeketatvahai jo acchekarmo ki vajah se paramatka me vilin ho saktehai).

RAHIM KE DOHE (rahimkeanusaar prem bahut punithai, issebachakarrakhnachahiey, rahimkeanusaarmadhurbaarbolnichahieykhari baton se dildukhnna to dur vemitratakeliey layaknahi ban jaate, taruvarjistarike se apna phal khud nahikhatausitarah bade log sampatti ko ikkatakarkedusaronkemadadkelieydetehai to usme koi kharabinahihai, pani ka mahatva ko batatehaijise manav me manyshyarupimanavaata kjarurathai).

### UNIT – II (LECTURE HOURS: 15)

#### CHARU CHANDRA KI CHANCHAL KIRANE:

(Maithili charanguptkepanchavati kavya se liyagayapdyahai. Ismeprakrutivarnan ka adhikstaandiyagayahai.

Chandi raat ka varnan, nadi ka varnan, ityadi, 2. Panchavati ki chaya me parnakutirhaijiskesammukhlakshmanpahredari banker baithahuahai, kisivrat me leen yah nidra ko khote hue vipin ko apnavaasbanahuahaiyise is kutiya me kyadhanhai. Mritymalok ki papon ko mitane swami sang jo aayihavah teen lok ki lakshmi hai, uskekhatir ye lakshmanpehredaribanahuahai.)

**VAH TODTI PATHAR:**

(niraladwarakrut ek diyakavitahaijismedopherkesamay me bin cchayadhup me baithkarpathartodrahihaiuskavarnanhai.)

**KYA PUJAN KYA ARCHAN RE:**

(mahadevivarmadwarakrutkavita me ye deh hi devalaykebarabarhai, jiskojis par nivasishwar ka ehshaa ho to manyshyjindagi ka saakarmilega. Isi tatv ko lekarvarmacchayavaaditvatva ko darshate hue is kavita ko rachihain.

**JO BEET GAYI SO BAAT GAYI)**

(bacchan ji ne is kavitakedauraan ye darshaatehai ki jo baat beet chukihaiuske bare me chintakarnese kya lab? Aage ki agrasarhonapadega. Isi taty ko is kavitarashatihai).

**UNIT III (LECTURE HOURS: 15)**

**DAUD LAGHU UPANYAAS:** (mamtakaliadwaralikhitlaaghuupanyaas ek Madhya vargiyaparivaar ki kahani ko darshatahai. Ismepavanapne maa baap se dur naukrikeliyehabad se ahmedabaad aa jaatahai aur puranevicharonketyajnayevicharon se phalibut ho jaatahai. Isley maa baap aur uske beech ki duriyan bad jaatihai. Aur chotimotibaateapas me uthirehtihai. Vah ek ladki ko pasandkartahaiuskomaa pasandnahikarti, magaruskiparavasahuskonahivahaagebadkarsamuhikvivahkarlewtahai. Aaj kal ki pidi maa baap se badkar paise ka mahatvdehtehai. Akhir chota beta bhivideshchalejaatahai, lautkarnahiaane ki sambhavananahihai. Maa bap ka vilap bad to jaatahaimagarlautanahi)

**UNIT IV (LECTURE HOURS: 8)**

**VYAKARAN:**(vachan aur ling ka bed , striling se pulling me badaln, ek vachan se bahu vachan me baldne ka pura vivarantathaniyam ko dena)

**UNIT IV (LECTURE HOURS: 7)**

**Anuvaadabhyaas**

(Angreji se hindi me parivartankarnachoteshabdon ka anuvadkarnathathavakyon ka anuvaadsaath hi panktiyon ka anuvaadkarnaaadiabhyaas ko chotron ko dena)

**Text Books:**

1. VIVIDH MAALA: COMPILED BY BOS HINDI.

**REFERENCE:**

1. MANAK HINDI VYAKARAN. VANI PRAKHASHAN, N.DELHI.
- 2.

kavita.com%2FHindiPanchvatiMaithilisharanGupt.php&usg=AOvVaw33u82y1QBzUZw0cMQR-4x0&opi=89978449<https://www.youtube.com/watch?v=sh68KY1X2RA>

Course Title : MALAYALAM – II(T)	Course Code : 12 M
Semester <b>II</b>	Course Group : <b>MIL - II</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : <b>3 Credits</b>
Map Code: <b>A (Language Concept)</b>	Total Contact Hour : 60
CIA : <b>25 Marks</b>	SEE : <b>75 Marks</b>
Programme : <b>I Yr ALL UG PROGRAMMES</b>	# - <b>Semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	Class Session	CL
CO1	Understand the past scenario of ethnical people and their livelihood and thereby inculcating moral values.	PO2	12	U
CO2	Interpret the importance of environmental studies and a recalling the existence of humans in resilience with nature and its components	PO4	12	U
CO3	Adapt gender equity, need of protecting girl child and importance of Women empowerment	PO7	12	AP
CO4	Apply secularism and its challenges in the current scenario giving emphasis to live and let live	PO1	12	AP
CO5	Analyze the attractive features in Indraprastha which makes the capital of country unique	PO4	12	AN

## **UNIT -I SHORT STORIES**

**LECTURE HOURS: 12**

### **1. UTHUPPAANTEY KINAR – KAROOR NILAKANDA PILLA**

( Karur is a writer who has left his mark on Malayalam fiction with his meticulous life observations. His writings are distinguished by their sincerity, pure presentation and moderation.)

### **2. POOVANPAZHAM – VAIKKAM MUHAMMAD BASHEER**

(This carefully selected collection of Vaikom Muhammad Basheer's short stories are characterised by a variety in theme and tone. He has enshrined in them every kind of experience from the pangs of hunger and sex to the rapture of mystic vision. Its range includes stark realistic pictures of the material world as well as the realm of fantasy haunted by ghosts and spirits. Basheer has written on love and hate, on politicians and pickpockets, on the fancies of childhood and on the disillusionments of adult life with an intense sense of the tragedy of life and at the same time an irrepressible sense of humour)

### **3. SHABDIKKUNNA KALAPPA – PONKUNNAM VARKKI**

(It is the story of a heart-to-heart relationship between a farmer named Ouseph and a plowman named Kannan. As the beginnings tightened, Ouseph had to sell Kannan. Later, Ouseph rescues Kannan from the slaughterhouse, leaving even the emergency.)

## **UNIT -II SHORT STORIES**

**LECTURE HOURS: 12**

### **4. NASHTTAPPETTA NILAAMBARI - MAADHAVIKKUTTI**

(Madhavikutty was a storyteller who traveled in a dream world mixed with reality and imagination. Through her writings, she portrayed different facets of love and new definitions of gender relations. Neelambari tells the story of Dr. Subhadra who comes to Madurai in search of the love she lost in her teens. When she left Madurai to study in Madras and later lived in Kozhikode with her husband, Madurai remained



in Subhadra's mind as an unforgettable memory. In the streets smelling of jaggery, peach and marigold, in the cool interiors of the Madhura Meenakshi temple, Subhadra searched not only for the lost Nilambari, but also for her own identity.)

## 5. BIRIYANI – SANTHOSH EACHIKKANAM

(Santhosh Aechikkanam is surely one of the most influential writers in the present-day Malayalam short story. He has, to his credit, around eighty stories anthologized in half a dozen volumes. As a keen observer of life he has phenomenal skill in capturing the subtle nuances of the sordid side of the seemingly naive lives around him. The range of themes he deals with in his stories amply demonstrates his creative genius.)

## 6. KALLAN – MP NARAYANAPILLA

(Narayana Pillai is considered by many as one of the finest writers of Malayalam fiction. It was reported that he started writing during his stay in Delhi where he met [Kakkanadan](#) and was influenced by the writer; the first story was *Kallan* (The Thief). *Murugan Enna Pambatti*, *George Aramante Kodathi*, *Yathrakkidayil* and *Njangal Njangal Asuranmar* are some of his most notable short stories. Most of his short stories have been compiled in 5 anthologies viz. *Murugan Enna Pambatti*, *Sathragali*, *Anthikoottu*, *Njangal Asuranmar* and *M. P. Narayana Pilayude Kathakal*. He wrote only one novel, *Parinamam*, which was selected for the [Kerala Sahitya Akademi Award for Novel](#)

## UNIT - III TRAVALOGUE

LECTURE HOURS: 12

### PURUSHANTHARANGALILOODE – VAYALAR RAMAVARMMA

(Ramavarma's first poetry anthology was *Padamudrakal*, in 1948 which reflected his affinity towards Gandhian ideals in those days. Later he changed his thought towards communism and keep close contact with the communist party of India. There are notable literature works against cast and communal systems in Kerala even though he is from an upper caste family. But he had a good affinity towards Indian culture which is reflected in the poem *Sargga Sangeetham*. Between 1950 and 1961, he published a number of anthologies including *Konthayum Poonoolum* (1950), *Naadinte Nadam*, *Enikku Maramamilla*, *Mulankadu* (1955), *Oru Judas Janikkunnu* (1955), *Ente attolikavithakal* (1957), and *Sargasangeetham* (1961), a khandakavyam titled *Ayisha*, two short story anthologies,)

## UNIT - IV TRAVALOGUE

LECTURE HOURS: 12

### PURUSHANTHARANGALILOODE – VAYALAR RAMAVARMMA

(Vayalar Ramavarma was a famous poet and lyricist belonging to Malayalam. He remained the most popular lyricist during the glorious era of Malayalam film music in the 1960s and 1970s and was a recipient of Kerala state award for best lyricist 4 times. He was also a recipient of National Film award for best lyricist for the songs of *Achanum Bappayum*, which include “*Manushyan Mathangale Srishtichu*”. He was also a famous poet, best known for his poems – *Sargasangeetham*, *Mulankaadu*, *Padamudrakal*, *Konthayum Poonoolum*, *Enikk Maranamilla*, *Aayisha* and *Oru Judas janikkunnu*, and recipient of Kerala Sahitya Academy Award for

poetry in 1962 for the poetry collection – *Sargasangeetham*)

## UNIT - V MALAYALABHASHAYUM COMPUTERSAHITHYAVUM

LECTURE HOURS: 12

### E MALAYALAM

(A study on electronic Malayalam penned by Suneetha T V offering detailed study of the Malayalam cyber world ranging from e-mail to e-book and blog to web portals. 'E. Malayalam' has eight essays including Bhasha Sankethika Vidyayum Computerum, Malayalm Computing, Internetile Malayalam, E. Malayalam)

### TEXT BOOKS:

- T1. Uthuppaantey Kinar - Ediiton – 2, DC Books – 1990 - Karoor Niilakantappillai
- T2. Poovambhazham – Edition – 3, DC Books – 2003 - Vaikkam Muhammad Basheer
- T3. Shabdikkunna Kalappa – Edition – 3, 2000, Current Books, Ponkunnam Varkki
- T4. Nashttappetta Neelambari – Edition – 40, DC Books, 2008, Maadhavikkutti
- T5. Biriyaani – Edition – 18, DC Books,2008, Santhosh Eachikkaanam
- T6. Kallan – Edition – 6, DC Books,2003, M P Pavithran
- T7. Purushaantharangaliloode –Edition – 10 Saindhava Books, 1999, Vayalaar Ramavarmma
- T8. E- Malayalam – Edition – 3, Kerala Bashainstitute 2019, Sunitha TV

### REFERENCES:

- R1. Malayalacherukatha Sahithyacharithram – Edition – 6, Kerala Sahithyaacademi, 2000, Dr.M.M.Basheer
- R2. Malayalasaahithyacharithram – Edition – 6 –Kerala Bashainstitute TVM, - 2003, Kalpatta Narayanan
- R3.E- Malayalam – Edition – 3, Kerala Bashainstitute 2019, Sunitha TV

### WEB RESOURCES

- [https://youtu.be/hOgGteIBC\\_M](https://youtu.be/hOgGteIBC_M) <https://youtu.be/QDj7RApGg6k>  
<https://youtu.be/M8DNtoB0kTA> <https://youtu.be/rJ1UEyI65qk>  
<https://youtu.be/-MqXQnpTJ3k> <https://youtu.be/jMi-1OwSIB4>  
<https://youtu.be/GE-wyIB0OtA> [https://youtu.be/QVId\\_t6DT\\_M](https://youtu.be/QVId_t6DT_M)  
<https://youtu.be/WNEye7uOyms> <https://youtu.be/UCn3hfj8Apo>  
<https://youtu.be/amobVw5Bvko> [https://youtu.be/vSTZVrSx\\_Xw](https://youtu.be/vSTZVrSx_Xw)

<sup>e</sup> r	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
II	MIL-II	French-II	3	4	-	-	25	75	100	3

Course Title : <b>FRENCH-II (T)</b>	Course Code : <b>21 F</b>
Semester : <b>II</b>	Course Group : <b>MIL-II</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : <b>3</b>
Map Code : <b>A (Language Concept)</b>	Total Contact Hours : <b>60</b>

CIA : 25 Marks	SEE#	: 75 Marks
Programme : ALL I YR UG PROGRAMMES (Except CS&HM) # - Semester End Exam		

No.	Course Outcome(Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	Class Session	CL
CO1	Parler de ses activités quotidiennes, Demander/Dire l'heure, Proposer/Accepter/Refuser une sortie, Decrire une personne.	PO2	12	R
CO2	S'informer sur un logement, exprimer des règles de vie commune, Expliquer un problème domestique.	PO2	12	U
CO3	Exprimer une émotion, Parler de sa santé et de sport, Exprimer son accord ou son désaccord, Exprimer une obligation, une interdiction, Donner un conseil.	PO4	12	AP
CO4	Reserver une chambre d'hôtel, Decrire une ville, un pays, Decrire un paysage, Exprimer la préférence, Ecrire une carte postale.	PO4	12	AN
CO5	Parler de ses études et de son université, Parler de ses compétences, Parler de son projet professionnel, Parler de son métier.	PO7	12	C

#### UNIT – 1: Qu'est-ce qu'on fait aujourd'hui ? - (Lecture Hours: 12 Hrs)

- Communication** - (Translation & Comprehension Passages)  
**Grammaire** - (Grammar Exercises)  
**Vocabulaire** - (Vocabulary Exercises)  
**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

#### UNIT – 2: Chez moi - (Lecture Hours: 12 Hrs)

- Communication** - (Translation & Comprehension Passages)  
**Grammaire** - (Grammar Exercises)  
**Vocabulaire** - (Vocabulary Exercises)  
**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

#### UNIT – 3: En forme - (Lecture Hours: 12 Hrs)

- Communication** - (Translation & Comprehension Passages)  
**Grammaire** - (Grammar Exercises)  
**Vocabulaire** - (Vocabulary Exercises)  
**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

#### UNIT – 4: Bonnes vacances ! - (Lecture Hours: 12 Hrs)

- Communication** - (Translation & Comprehension Passages)  
**Grammaire** - (Grammar Exercises)  
**Vocabulaire** - (Vocabulary Exercises)  
**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

#### UNIT – 5: Au travail ! - (Lecture Hours: 12 Hrs)

- Communication** - (Translation & Comprehension Passages)  
**Grammaire** - (Grammar Exercises)

**Vocabulaire** - (Vocabulary Exercises)

**Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**Text Books:**

EDITO – NIVEAU A1- Methode de francais | Edition: 2 | Les Editions Didier | Caroline Sperandio | Lucie Mensdorff-Pouilly | Serguie Opatski | Violette Petitmengin | Sylvie Pons | Hamza Djimli (DELFI) | Julie Veldeman-Abry (Phonetique) | (January, 2022)

**Reference Books:**

**R1.** Larousse – Dictionnaire bilingue | Edition: 2 | Hachette | MARIANNE DURAND (2006)

**R2.** Collins dico | Edition: 8 | MAURY-IMPRIMEUR SA MALESHERBES, FRANCE.

Harper co | MARIANNE DURAND (2006)

**Website Links:**

i) [wordreference.com](http://wordreference.com) ii) [verb2verbe.com](http://verb2verbe.com) iii) [tolearnfrench.com](http://tolearnfrench.com)

Course Title : <b>ENGLISH – II (T)</b>	Course Code : <b>22E</b>			
Semester: <b>II</b>	Course Group : <b>ELN-II</b>			
Teaching scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : <b>3</b>			
Map Code : <b>A</b>	Total Contact Hours: <b>60</b>			
CIA : <b>25Marks</b>	SEE : <b>75Marks</b>			
Programme All UG Programmes	<b>#-SemesterEndExam</b>			
<b>COs.</b>	<b>Course Outcome (COs):</b>	<b>PSOs</b>	<b>Cl. Ses</b>	<b>CL</b>
	<b>After successful completion of this course, the students will be able to</b>			
<b>CO1</b>	Enrich the students with pronunciation and accuracy in the use of English Language.	PSO1 and PSO4	12	R
<b>CO2</b>	Aid them understand the responsibilities and societal problems and solutions along with one act plays.	PSO1 and PSO4	12	R
<b>CO3</b>	Teach them various opportunities and success of different noble people.	PSO1 and PSO4	12	U
<b>CO4</b>	Help the students to learn the variety of sentence structures.	PSO1 and PSO4	12	U
<b>CO5</b>	Become an employable person with effective communication	PSO1 and PSO4	12	R

## UNIT I

### UNIT – I (ONE ACT PLAYS)

LECTURE HOURS- 12

1. **Chitra** - Rabindranath Tagore – Introduction – About the Author - The play adapts the story of Chitrāngadā and Arjuna from the Mahabharata. - Chitra beginning a conversation with Madana, the god of love, and Vasanta, the god of springtime and eternal youth - Chitra, the beauty of which he mentions, enters and Arjuna immediately strikes up a conversation with her - The play ends with Chitra finally admitting to Arjuna that she is the princess of which he spoke of and that she begged for beauty in order to win him over.

2. **The Sun** – John Galsworthy – Introduction – About the Author *The Sun*, a soldier returns from the WWI front to reunite with his fiancée, only to discover that she has jilted him for another man. The girl is nervous and guilty-the man is ready to fight for his woman--but the soldier cannot bring himself to fight anymore. The sun is shining, the soldier has returned home, and he will let nothing stand in the way of his high spirits. John Galsworthy's delightful one-act bursts with sunny cheer and the joy of being alive.

3. **The Boor** – Anton Chekhov Introduction – About the Author “The Boor is a romantic farce - a widow who is mourning her husband's death - disturbed in her home by a brutish man who her late husband owed him money, through their arguments about which of the genders is more faithful in relationships they ultimately fall in love with each other.

4. **Heart in the Ground** – Douglas Introduction – About the Author - **Heart in the Ground**, is a powerful and moving story of love- reconciliation- healing and hope, as a young farming couple learn to come to terms with the loss of their baby.

### UNIT – II (BIOGRAPHY)

LECTURE HOURS- 12

1. **Dr. APJ Abdul Kalam : Avul Pakir Jainulabdeen Abdul Kalam** 15 October 1931 – 27 July 2015) was an Indian aerospace scientist and statesman who served as the 11th President of India - He thus came to be known as the *Missile Man of India*. Kalam served as the Chief Scientific Adviser to the Prime Minister and Secretary of the Defence Research. During his term as president, he was affectionately known as the *People's President*, saying that signing the Office of Profit Bill was the toughest decision he had taken during his tenure. Kalam was criticised for his inaction in deciding the fate of 20 out of the 21 mercy petitions submitted to him during his tenure

2. **Helen Keller:** Helen Adams Keller was an American author- disability rights advocate, political activist - lecturer. Born in West Tusculum, Alabama -she lost her sight and her hearing after a bout of illness when she was 19 months old. Annie had been blind, but had her eyesight restored by surgery. Charlie Chaplin Sarah was a teacher for the deaf. Later, during World War II, she visited with wounded army soldiers encouraging them not to give up. Helen spent much of her life working to raise money and awareness for people with disabilities, especially the deaf and the blind.

3. **Charlie Chaplin:** Sir Charles Spencer Chaplin KBE was an English comic actor, filmmaker, and composer who rose to fame in the era of silent film. He became a worldwide icon through his screen persona, the Tramp, and is considered one of the film industry's most important figures. The Masterpiece Features – The Gold Rush (1925), The Circus won Charles Chaplin his first Academy Award. City Lights proved to be the hardest and longest undertaking of Chaplin's career. In Modern Times Chaplin set out to transform his observations and anxieties into comedy. His last picture, "A Countess from Hong Kong". He was also a composer, having written and published many songs, among them: "Sing a Song"; "With You Dear in Bombay";

## UNIT – III (GRAMMAR )

## LECTURE HOURS- 12

**1. Active Voice and Passive Voice** In the active voice, the sentence's subject performs the action on the action's target. In the passive voice, the target of the action is the main focus, and the verb acts upon the subject.

Rita wrote a letter. (Subject + Verb + Object)

A letter was written by Rita. (Object) + (auxiliary verb) + (past participle) + (by subject).

She cooks food. (Subject + Verb + Object)

**2. Articles** -Definite article- **the** (before a singular or plural noun)-Indefinite article- **a** (before a singular noun beginning with a consonant sound) -**an** (before a singular noun beginning with a vowel sound) -Count nouns - refers to items that can be counted and are either singular or plural - non-count nouns - refers to items that are not counted and are always singular

**3. Question Tag** - Question tags are short questions at the end of statements. They are mainly used in speech when we want to: **confirm that something is true or not**, or - **to encourage a reply** from the person we are speaking to. Question tags are formed with the auxiliary or modal verb from the statement and the appropriate subject. A **positive** statement is followed by a **negative** question tag. Jack **is** from Spain, **isn't** he? Mary **can** speak English, **can't** she? A **negative** statement is followed by a **positive** question tag. They **aren't** funny, **are** they? He **shouldn't** say things like that, **should** he?

**4. Sentence Pattern - Subject:** A person, animal, place, thing, or concept that does an action. Determine the subject in a sentence by asking the question "Who or what?" **"I** like spaghetti. **He** reads many books. **Verb:** Expresses what the person, animal, place, thing, or concept does. Determine the verb in a sentence by asking the question "What was the action or what happened?" (The *be* verb is also sometimes referred to as a copula or a linking verb. It links the subject, in this case "the movie," to the complement or the predicate of the sentence, in this case, "good.") **Object:** A person, animal, place, thing, or concept that receives the action. Determine the object in a sentence by asking the question "The subject did what?" or "To whom? /For whom?" I like *spaghetti* He reads *many books*.

## UNIT – IV (LANGUAGE COMPONENTS)

## LECTURE HOURS- 12

1. **One Word Substitution:** One word substitution is the use of one word in place of a wordy phrase in order to make the sentence structure clearer. The meaning, with the replacement of the phrase remains identical while the sentence becomes shorter. Her younger son has an extreme fear of dogs: **Her son has cynophobia.** I am interested in the study of ancient things: **I am interested in archaeology.**

2. **Idioms:** An **idiom** is a phrase or expression that typically presents a figurative, non-literal meaning attached to the phrase; but some phrases become figurative idioms while retaining the literal meaning of the phrase. Break the ice -To get the conversation going. Provide a conversation prompt. **Example:** Starting class with a joke or subjects students like will help to **break the ice.**

3. **Words from Headlines:** the heading or caption of a newspaper article -publicize widely or highly, as if with a headline - provide (a newspaper page or a story) with a headline - Headlines play a very important in any newspaper. Actually, Headline is used to attract the user to read the whole news. Headlines describe the whole news in short. Utterly-Completely, Scramble - Climb, Feud – Fight
4. **Homophones and Homonyms:** Words that sound alike but are different in meaning and spelling are called as Homophones ('bored'- 'board'); rather words that are similar in spelling and pronunciation but different in meaning are called as Homonyms ('park'- 'park').

## UNIT – V (LANGUAGE STUDY AND COMMUNICATION)      LECTURE HOURS- 12

1. **Letter Writing :** A letter is a written message that can be handwritten or printed on paper. It is usually sent to the recipient via mail or post in an envelope, although this is not a requirement as such. Any such message that is transferred via post is a letter, a written conversation between two parties. Letters are of two types – 1. Formal Letter A Letter written for a formal purpose is called a Formal letter. It addresses a serious issue 2. Informal Letter - A Letter written for an informal purpose is called an Informal letter. It is written for a casual purpose.
2. **Poster Making:** Posters have become an increasingly popular means of communicating research findings. However, at conferences there are often a large number of posters on display, so you need to ensure that yours is well-designed to attract, and hold, other people's attention. Elements of Mail Writing- The Format of Mail Writing
3. **E-mail Writing:** Email stands for electronic mail. It is the easiest and cheapest way of communication, which is primarily sent from the computer and mobile devices to one or multiple recipients. An email can be formal or informal depending on the circumstances if it is for the office purpose, Companies, organizations, govt. departments and officers use formal emails which are written like formal letters for official communication. Informal emails are sent to family, relatives, friends and sometimes acquaintances and are written in a friendly and conversational style.
4. **Note Making:** Notes are a permanent record of information that will help you prepare for seminars, presentations, assignments and examinations. Note-making helps you concentrate on what you are reading, watching or hearing; it helps you to understand new information and new ideas; noting things down in your own words helps to place them in your long-term memory. Effective note-making is a key academic skill; The Procedure of Note Making. Read the passage carefully and thoroughly While reading the passage, underline the key sentences. It will help you in forming the title and sub-titles. Make a rough note of the main points and give them a logical sequence. Use any format you like but it should depend on the theme of the passage. A little practice will make you adept in note-making.

### **Text Books :**

- T1. Tagore. *One Act Plays*. New Century Book House, 2004.  
 T2. Virtual English. Prepared by The Department of English. 2018.  
 T3. Effective English | Edition:1 | RVS | Department of English. 2019

### **Reference Books:**

- R1. High School English Grammar And Composition Book. Wren & Martin. 2017.  
 R2. Developing Reading Skills. Edition 1. Bloomsbury. 2015.



Course Title : <b>Human Physiology and Endocrinology</b>	Course Code : 23A
Semester : <b>II</b>	Course Group : <b>DSC - III</b>
Teaching Scheme in Hrs (L:T) : <b>4:0:4</b>	Credits 4
Map Code: <b>C(THEORY )</b>	Total Contact Hours: 48
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>BSC-BC</b>	# - <b>Semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to	Pos	Cl.Ses	BLOOM'S TAXONOM
CO1	Describe the structure and functions of human anatomy digestive system	PO1& PS01	10	U
CO2	Describe the composition and functions of human bodyfluids	PO1& PS01	10	R
CO3	Explain the functions of heart,blood vessels and respiration,exchange and transport of gases	PO1& PS01	10	U
CO4	Explain organization and conduction of impulses and brainstructure and function	PO1& PS01	10	R
CO5	Describe the structure, functions of kidney and renal functionand micturition.	PO1& PS01	8	U

## **UNIT-1 (LECTURE HOUR 10)**

### **DIGESTIVE SYSTEM**

ANATOMY OF THE DIGESTIVE SYSTEM - Structural features of Intestinal organs, Parts of the digestive system

SALIVARY, GASTRIC AND BILIARY SECRETIONS - Composition, properties, Mechanism and functions

DIGESTION , SECRETION, AND ABSORPTION IN THE SMALL INTESTINE - Digestion and absorption of carbohydrates, lipids and proteins.

## **UNIT-2 (LECTURE HOUR 10)**

### **BODY FLUIDS**

EXTRACELLULAR FLUID-BLOOD and PLASMA - Definition ,composition and function

BLOOD CELLS - WBC, RBC AND PLATELETS - Introduction and functions

BLOOD GROUPS AND BLOOD COAGULATION - ABO & Rh factor - Mechanism of blood coagulation

## **UNIT-3 (LECTURE HOUR 10)**

### **CIRCULATORY & RESPIRATORY SYSTEM**

CIRCULATION – function of Heart and Blood vessels

RESPIRATION – internal &external respiration

EXCHANGE OF GASES - Exchange of gases between lung and blood and between blood and tissues

Transport of respiratory gases O<sub>2</sub> and CO<sub>2</sub>

## **UNIT-4 (LECTURE HOUR 10)**

### **NERVOUS SYSTEM**

CENTRAL NERVOUS SYSTEM - General organization

FUNCTIONAL UNITS- NEURON - Structure and its function

RESTING AND ACTION POTENTIAL - Conduction of nerve impulses

SYNAPTIC TRANSMISSION.

BRAIN – structure and function

## **UNIT-5 (LECTURE HOUR 8)**

### **EXCRETORY SYSTEM**

KIDNEY - Structure and functions of kidney

NEPHRON - Structure & composition

MECHANISM OF URINE FORMATION - Glomerular filtration

RENAL FUNCTION - Tubular reabsorption and tubular secretions

MICTURITION - Urinary Infection

### **ENDOCRINAL SYSTEM**

HORMONES- Introduction, chemical structure. Classes of chemical messenger Anterior and posterior lobe of pituitary hormones. Hormone secretion and Transport. Mechanism of hormone action.

Text Books :

T1 Medical Physiology | Edition:5 | JP | Dr.SembulingamL AND SembulingamPrema(2012)

T2 Medical Physiology | Edition:11 | Arun printers | ChatterjeeCC(2013)

Reference Books :

R1 Endocrinology | Edition:1 | MJP | Prakash S. Lohar(2015)

R2 Molecular cell biology | Edition:6 | W.H.freeman | LodishHarvey(2017)

Course Title : <b>Human Physiology and Endocrinology</b>	Course Code : 63P
Semester : <b>II</b>	Course Group : <b>DSC - XI</b>
Teaching Scheme in Hrs (L:T:P) : <b>0:0:4</b>	Credits :2
Map Code: <b>C(THEORY )</b>	Total Contact Hours: 60
CIA: <b>40 Marks</b>	SEE # : <b>60 Marks</b>
Programme: <b>BSC-BC</b>	# - <b>Semester End Exam</b>

#### LIST OF EXPERIMENTS:

1. Estimation of glucose by OT method
2. Estimation of protein by LOWRY'S method
3. Collection of blood- separation of serum and plasma
4. Determination of bleeding time
5. Determination of clotting time
6. Preparation of Bicarbonate buffer
7. Estimation of Hb by shali's method
8. Analysis of urine sample.
9. Determination of blood groups

Course Title	: <b>BIO INSTRUMENTATION TECHNIQUES (T)</b>	Course Code	: 23A
Semester	: <b>II</b>	Course Group	: <b>DSC-IV</b>
Teaching Scheme in Hrs (L:T:P)	: <b>4:0:0</b>	Credits	<b>4</b>
Map Code	: <b>C(THEORY CONCEPTS)</b>	Total Contact Hours	<b>60</b>
CIA	: <b>25 Marks</b>	SEE	: <b>75 Marks</b>
Programme: <b>BSC-BC</b>			

No.	<u>Course Outcome</u>	<u>PSOs</u>	<u>Cl. Ses</u>	CL
CO1	Understand the terms like pH, pOH, acidic, basic, neutral solutions and universal indicator and acquire the practical skill.	PSO 1	12	U
CO2	Explore the use of suitable chromatographic or electrophoretic techniques for actual analytical problems.	PSO 2	12	AP
CO3	Motivating the students in handling the basic apparatus and instruments.	PSO 2	12	AP
CO4	Identifying the separation of proteins/peptides by selecting appropriate separation techniques	PSO 2	12	R
CO5	Understand the theoretical principles of radioactivity and appreciate the uses of radioisotopes.	PSO 1	12	R

#### UNIT – I

(LECTURE HOURS: 12)

pH - Introduction (Definition and applications), Determination of pH- (using indicators and pH meter), Electrode :

Types-(calomel electrode, silver-silver chloride electrode and standard hydrogen electrode), Henderson's Hasselbach equation-(Relationship between pKa & pH) Buffer : Acids & Bases- (Buffer system, Bicarbonate Buffer system, Hb Buffer system)

## UNIT – II

### (LECTURE HOURS: 12)

Chromatography: (Definition and its types), Paper Chromatography- (Principle, Technique & applications), Thin Layer chromatography- (Principle, Technique & applications), Gas Liquid chromatography- (Principle, Technique & applications), Ion exchange chromatography- (Principle, Technique & applications), HPLC- (Principle, Technique & applications), Affinity Chromatography- (Principle, Technique & applications), Molecular sieve Chromatography- (Principle, Technique & applications)

## UNIT – III

### (LECTURE HOURS: 12)

Electrophoresis: Introduction- (types and Factors affecting electrophoretic mobility), Agarose Gel Electrophoresis- (Principle, technique and applications), SDS – PAGE- (Principle, technique and applications), Immunoelectrophoresis- (Principle, technique and applications), Centrifugation- (Introduction, types of centrifugation and Rotor types), Ultra centrifugation- (Working, applications and its types.)

## UNIT – IV

### (LECTURE HOURS: 12)

COLORIMETRY – Introduction- (colour and absorption), Beer - Lambert's law- (Principle & Laws), Working of a single cell photoelectric colorimeter - (Principle instrumentation & applications), Spectrophotometry- (Principle, Instrumentation and applications), Fluorimetry- (Principle, Instrumentation and applications)

## UNIT – V

### (LECTURE HOURS: 12)

ISOTOPES AND RADIOACTIVITY – Introduction- (Tracer techniques), Radioactive decay and units of radio activity- (Curie, Becquerel, specific activity), Detection and measurement of radio activity- (GM counter, Scintillation counting, Autoradiography), Applications of radioisotopes, Biological and Medical sciences

### Text Books :

T1: Biophysical Chemistry | Edition:4 | Himalaya Pub. House | UpadhyayNath(2009)

T2: Practical Biochemistry | Edition:3 | Tata McGraw-Hill Education | David Plummer(1988)

### Reference Books :

R1: Analytical Biochemistry | Edition:4 | Longman | David James Holme (1997)

Course Title : <b>BIOINSTRUMENTATION TECHNIQUES (P)</b>	Course Code : 23P
Semester : <b>II</b>	Course Group : <b>DSC-IV</b>
Teaching Scheme in Hrs (L:T:P) : <b>0:0:4</b>	Credits : <b>2</b>
Map Code : <b>H (PRACTICAL - EXPERIMENTS)</b>	Total Contact Hours: <b>60</b>
CIA : <b>40 Marks</b>	SEE : <b>60 Marks</b>
Programme: <b>BSC-BC</b>	

#### LIST OF EXPERIMENTS

1. Determination of pH
2. Preparation of Buffers
3. Paper Chromatography – Circular
4. Thin Layer Chromatography.
5. Separation of compounds using centrifuge.
6. SDS-gel Electrophoresis – Demonstration
7. Estimation of Protein by FOLIN - CIOCALTEAU method
8. Estimation of Urea by DAM-TSC method
9. Industrial visit to learn techniques in radioactivity

# SEMESTER – III

### SEMESTER –III

S. No.	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
<b>III</b>	MIL – III	Tamil - III	3	4	-	-	25	75	100	3

Course Title : <b>TAMIL III ( T )</b>	Course Code : 31T
Semester : <b>III</b>	Course Group : <b>MIL - III</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : 3
Map Code: <b>A ( Language- Concepts)</b>	Total Contact Hours: <b>60</b>
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>ALL II YEAR UG PROGRAMMES</b> <span style="float: right;"><b>Semester End Exam</b></span>	

No.	Course Outcomes (Cos): After completion of this course, the students will be able to	POs	CL. Ses	CL
CO1	பொதுவாக தமிழ் மொழியைப் பேசும் திறனைப் பெறும்	PO7	14	U
CO2	தமிழ் மொழியின் வரலாற்று, அமைப்பு, சொல்வகை, இயற்கை, அழகு, பயன்பாடு, மொழிபெயர்ப்பு, மொழிபெயர்ப்பு, மொழிபெயர்ப்பு	PO7	14	U
CO3	தமிழ் மொழியின் சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை	PO3	12	R
CO4	தமிழ் மொழியின் சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை	PO2	10	AP
CO5	தமிழ் மொழியின் சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை, சொல்வகை	PO1	10	R



அலகு E காப்பிய இலக்கியம்

பாடவேளைகள் - 14

காப்பியங்கள் சிலப்பதிகாரம் (வேளிற்காதை - தமிழகத்தின் எல்லையும் தென்றலின் வருகையும் - மாதவியின் பிரிவும் - யாழ்மீட்டலும் - யாழின் உறுப்பிகள் - மாதவி கோவலனுக்குத் திருமுகம் அனுப்புதல் - மாதவி கடிதத்தை வசந்தமாலையிடம் கொடுத்தல் - கோவலன் மாதவியின் எண்வகை நடப்புகளை நடத்துக்காட்டல் - காண்வரி - கண்கூடுவரி கிளர்வரி - புறவரி - வசந்தமாலை உரைத்தல் - மாதவியின் நம்பிக்கை.)  
மணிமேகலை (மணிமேகலா தெய்வம் - வந்து தோன்றிய காதை - உதமகுமரன் மயக்கமும் சதமதி உரையும் - சதமதி தன்வரலாறு உரைத்தல் - தந்தையின் பரிவு - சதமதியின் தந்தை தேடுதல் - தந்தையின் பரிவு - சங்கதாமன் உரை - மணிமேகலா தெய்வம் தோன்றலுட்புத்தபீடிகை வலம் வருதல் - புலவர் எனும் பூங்கொடி - அகழி ஞாயில் - கோட்டம் - கோயில் பெண்ணாக உருவகித்தல் - அந்திமாலையின் வரவு - பெடையின் நிலை - அன்னச் சேவல் நிலை - பசுவின் நிலை - கோவலர் நஜிலை - மகளிர் நிலை. அந்திமாலைச் சிறப்பு.)

கம்பராமாயணம் - வாலிவதைப்படலம் (வாலி லேரருக்கு எழுந்த சூழல் - தாரையின் தடையுமிடம் விடையும் - கிப்கிந்தைக்கு அரசே வலிமையில் பாதிக்கப்பெற்று விடுவேன் - இரண்டு மலைகள் மோதுதல் - ஒருவன் தன் திரிகையிலே மண்ணை வைத்துக் குட்டத்தை வன்னவது போல இருத்தல் - இருவரும் ஒருநாயின் வயிற்றில் பிறந்த பிள்ளைகள் - சந்தன் உபசந்தன் என்னும் மன்னர்கள் - கையினால் ஒருவரை ஒருவர் பற்றி எடுப்பர் - காற்றைப் போல சுற்றிச் சுற்றி வருவர் - கால்களால் பின்னிக் கொள்வர் - வாலிமேல் இராமன் அம்பு எய்தல் - கத்திரவன் மகளாகிய கக்கிரவன் - இராமன் மறைந்து நின்று அம்பை விடுத்தல் - வாலி அம்பு பற்றி எடுத்தல் - என்மீது அம்பு விட்டவன் ஷேபல் ஒப்பற்ற செயல் - வாலியின் செய்கையைக் கண்ட தேவரும் படைவீரரும் பிறரும் போற்றல் - அம்பில் பொறித்த நாமம் மூன்று உலகங்களுக்கும் மூல மந்திரம் - வாலி இராமனை இகழ்ந்துரைத்தல் - தாமரை பூப்பதைப் போல அவன் தோன்றினான் - மரபைக் காத்த தீமை செய்தாய் - பரதனுக்கு முன் தோன்றியவன் - என்பால் எப்பிழையைக் கண்டாய் - அறுச் செயலன்று தகுதியற்ற செயல் - இராமன் மறுமொழி கூறல் - வாலியின் மனமாற்றம் - சிறியன சிந்தியாதவன் வாலி. ; திருவடிகளை எனக்குத் தருவாயாக என்று வேண்டுகல்.)

அலகு F - நாவல்

பாடவேளைகள் - 14

புத்தமணன் - சுப்பரபாரதி மணியன் (அதிகாணல் பெருமூலம் குயிலின் வீடும் - சிவராத்திரியும் - பயணமும் - சிவராசனி - தேனம்மையின் படிப்புகள் - போதை ஆகாயியும் - உள்வழிப்பாதையும் - அமெரிக்கத் தகவலும் - பெண் வருதலையும் - சமங்கலித்திட்டமும் - கடிதமும் வீடும் - விதைகளும்; கணவும் - குறுந் செயற்களும் - குற்றச் செய்திகளும் - சுமணல் - பூவுலகின் நுண்பர்கள் - அஞ்சலி.)

அலகு III - இலக்கணம்

பாடவேளைகள் - 12

அணி இலக்கணம் (அணி இலக்கண நூலும் - வகைகளும் - தன்மையணி - பின்வருநிலையணி - உவமையணி - உருவக அணி - சிலேடையணி - தற்குறிப்பேற்ற அணி)

அலகு IV - பயிற்சி

பாடவேளைகள் - 10

1. சிறுகதை மூலவாக்கம் - (கதைக்களம் - கதை மாந்தர்கள் - கதைப்பின்னல் - உத்திகள்)
2. கவிதை மூலவாக்கம் - (மரபுக்கவிதை - புதுக்கவிதை - கஜல்கவிதை - ஹைக்கவிதை - லிமராக்கவிதை)
3. நூல் மதியீட்டுப்பயிற்சி (விமர்சனப்படிவையுடைய நூல் தரும் கருத்துகள்).

அலகு V - இலக்கியவரலாறு

பாடவேளைகள் - 10

1. காப்பியங்கள் தோற்றம் வளர்ச்சி - (காப்பியம் - விளக்கம் - காப்பிய பகுப்புகள் - காப்பிய இலக்கணம் - காப்பிய வகைகள்)
2. நாவலின் தோற்றம் வளர்ச்சி - (நாவல் - இலக்கணம் - நாவல் தோற்றம் - மேனாட்டில் நாவல் இலக்கியம் - நாவல் வகைகள் - தமிழ் நாவல்கள்.)

பார்வைவகைகள் :

1. தமிழிலக்கியவரலாறு - முடிவரதராசன்
2. சிலப்பதிகாரம் - தாமரவேங்கடசாமி நாட்டார் - கழக வெளியீடு
3. மணிமேகலை - உ.வே.சாமிநாதய்யர் - கழக வெளியீடு
4. கம்பராமாயணம் - ஆசிரியர் சூரகம்பன்கழகம்
5. புத்தமணன் - சுப்பரபாரதி மணியன் - உயிர்மைபதிப்பகம்
6. நல்ல தமிழ் எழுதவேண்டுமா? - அ.கி.பரந்தாமன் - பாரிநிலையம்

r	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
III	MIL – III	HINDI -III	3	4	-	-	25	75	100	3

SEMESTER - III

Course Title : <b>HINDI-III (T)</b>	Course Code : 23H
Semester : <b>III</b>	Course Group : <b>MIL - III</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits 3
Map Code: <b>A ( Language- Concepts)</b>	Total Contact Hours: <b>60</b>
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>ALL II YEAR UG PROGRAMMESS</b>	<b>semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	CS	CL
CO1	Getting & describe knowledge regarding Personal letter writing in Hindi, for example letter to father, letter to mother, letter to friend.	PO3	12	U
CO2	Providing & applying knowledge of Letter writing in Hindi Social letters in Hindi	PO1	12	AP
CO3	Telling & practice about the rules of Official Correspondence Business letters in Hindi	PO2	12	AP
CO4	Providing & organizing the practice on Drafting and noting Official Letters in Hindi	PO3	12	AN
CO5	. Knowing & practicing about the names of posts, names of sections and related terminology Know about Technical Words	PO1	12	AP

**NijiPatraLekhan:**(private letters, letter to father, letter to mother, letter to friend, letter to other relations is comes under nijipatra ,pitajimatajike naam patra Mitra, BhaiaadikenaampatraParibhashikShabdawali–Prashasanik)

## UNIT II

**LECTURE HOURS: 12**

**SamajikPatraLekhan:**(SamajikPatra – Arthaur,BhedAavedan,Patra – Noukri,Chutti,aadiDakAdhikarikenaampatra,Nagarpalikakenaampatra,Parivahan,pradhikaran,ke,naam,patra ,Paribhashikshabdawali–vidhi)

## UNIT III

**LECTURE HOURS:12**

**VyavasayikPatraLekhanVyavasayikPatra:** (ArthaurBhed, Prakashakkenaampatra, Pooch-Taach, Shikayathi, Kshatipoorthiaadivishyo par patralkhan, Paribhashikshabdawali – Padnamvamantralayokenaam)

## UNIT IV

**LECTURE HOURS:12**

**SamanyaParichay:**(SarkariPatra, Ardh-SarkariPatra, Gyapan, Paripatra, Anusmarak, Adhisuchna, Avedan, ParibhashikShabdawali – Banking).

## UNIT V

**LECTURE HOURS: 12**

**PratiyogiPariksha :**(ispar adharitPatrachar se SambandhitPrashikshanKarya,Praroop banana ka Prashikshandena, Tippanlikhn ek Prashikshan Dena, Vibhinnapratyogiparikshaoke bare meinsuchnapradandena)

## Reference Books

1. AlekhanaurTippan – Prof. Viraj
2. Alekhan - Kichlu

## Related Online Contents (MOOCs, SWAYAM, NPTEL, YouTube, Websites, etc.)

1. <https://youtu.be/-kUPGG0B4tU>
2. <https://www.youtube.com/watch?v=xk14MNB1r7k>

	Course Opted	Course Name	D	L	T	P	CI A	ES E	Marks	Credits
I	MIL- III	Malayalam – III	3	4	-	-	25	75	100	3

## MALAYALAM

**ACADEMIC YEAR 2023-2024**

**SEMESTER III**

Course Title	: MALAYALAM – III(T)	Course Code	: 23M
Semester	: <b>III</b>	Course Group	: <b>MIL - III</b>
Teaching Scheme in Hrs (L:T:P)	: <b>4:0:0</b>	Credits	: <b>3 Credits</b>
Map Code	: <b>A (Language Concept)</b>	Total Contact Hour	: 60
CIA	: <b>25 Marks</b>	SEE	: <b>75 Marks</b>
Programme	: <b>II Yr ALL UG PROGRAMMES</b>	<b># - Semester End Exam</b>	

No	Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	Class Session	CL
CO1	Compare and contrast the primary characters in the play	PO6	12	AN
CO2	Categorize the major events in the play in a chronological order	PO4	12	AN
CO3	Describe the difficulties of the uneducated hero who he is hailing from a lower middle class family	PO7	12	U
CO4	Sequence the events in the screenplay though the past events are intervening in the form of flashback	PO5	12	AP
CO5	Summarize the efforts of Operator for the reunion for that child with his family in Gujarat	PO1	12	U

**UNIT : I DRAMA**

**LECTURE HOURS: 12**

### **1128 IL CRIME 27 – CJ THOMAS**

(CJ is a bold experiment among Malayalam dramas. Crime 27 in 1128, a play written by Thomas in 1954. It has also been hailed as the first experimental drama in Malayalam. The play is characterized by being a play within a play . The main theme is death. The plot is very simple. Erupaka's husband, Marcos, and her husband, Varki, also disappear. It is said that he died in the furnace and was not killed. At each stage, the Guru convinces the disciple what kind of reaction this incident will have in the press, family, and court institutions. This play is a discussion about death. The playwright's question is what will be the dead man's view of death.

The Guru answers that his death will be a perfect goose. And then how the living approaches the philosophical problem of death (The Guru shows through the play which takes place in various scenes.)

**UNIT : II DRAMA**

**LECTURE HOURS: 12**

**1128 IL CRIME 27 – CJ THOMAS**

(Just when you think that the news of the death will be prominently featured in the newspaper, the minister's speech on duck farming is received in the press office. It becomes headline news. Then the news of the death was reduced to an inch. It is generally believed that death will be terrible and mournful in the house of death. But did you see it there? Debt between the deceased's wife and father. A point of contention is how the death benefit should be spent. The wife wants to make porridge for the little ones, the father wants them to eat opium. If it is in the court, the trial of the murder case is conducted very seriously. So 'Kodanta' is the translation of 'Kodavayer'. The judge steps aside. If they are policemen, they force the accused to commit suicide as per Ayurvedic medicine. Ant's neighbor Chucky, representing the common people, cages the judge, the government attorney, and the police. By the time the interrogation is over, Marcos, who was thought to be dead, returns. Thus death becomes a goose.)

**UNIT III SCREEN PLAY**

**LECTURE HOURS: 12 KAZHCHA – BLESSY**

(The screenplay starts in the backwater areas of Kerala which captures the current scenario of such villages in three to four cuts quickly and directly plunges into the life of a touring movie operator, Madhavan. His profession is outdated and he strives hard to survive but happily and peacefully leading a pleasant life with his family. Pavan, a vagabond boy who lost his entire family in the Gujarat massive earth quake. The boy finds himself with street children in Kerala who could not understand or speak his language)

**UNIT:IV SCREEN PLAY**

**LECTURE HOURS: 12**

**KAZHCHA – BLESSY**

(Madhavan is touched by his plight and the boy starts sticking around him. Slowly a special bond develops between them in spite of the language barrier. Madhavan takes the boy with him when he returns home to his family consisting of his parents, wife Lakshmi (Padmapriya) and daughter Ambili (Baby Sanusha). Soon the boy becomes a member of the family more so after he saves Ambili from an accident)

**UNIT :V SCREEN PLAY**

**LECTURE HOURS: 12**

**KAZHCHA – BLESSY**

(Overnight the boy becomes a small time hero but the subsequent publicity does him no good. The boy gets entangled in a legal battle for his custody and is put in a juvenile home in Kerala. Madhavan wants to adopt him but he has to prove that there is no living family remaining for the child. So a search for the boy's parents in earthquake ravaged Gujarat ensues, concluding in a realistic ending.)

**TEXT BOOKS:**

T1. DRAMA - 1128 – IL CRIME 27 – CJ THOMAS

T2. SCREENPLAY - KAZHCHA – BLEZY

**REFERENCE TEXTS:**

R1. Malayalanadakahithyacharithram – G Shankkarappilla – DC Books

R2. Malayalanadakam – Dr Ezhumattur Rajarajavarmma DC Books

RR3. Kairaliyude Katha – N Krishnapilla - DC Books\

3. Malayalasaahithyam Kalaghattangailoode – Erumeli Parameswaran Nair – DC Books  
R5. Thirakkathaa Sahithyam – Jose K Manual – DC Books

	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
III	MIL-III	French-III	3	4	-	-	25	75	100	3

Course Title : <b>FRENCH-III (T)</b>	Course Code : <b>31F</b>
Semester : <b>III</b>	Course Group : <b>MIL-III</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : <b>3</b>
Map Code : <b>A (Language Concept)</b>	Total Contact Hours : <b>60</b>
CIA : <b>25 Marks</b>	SEE# : <b>75</b> <b>Marks</b>
Programme : <b>ALL II YR UG PROGRAMMES (Except CS&amp;HM) # - Semester End Exam</b>	

No.	Course Outcome(Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	Class Session	CL
CO1	Parler de son parcours, Exprimer son intention de faire quelque chose, Parler de ses goûts, Proposer, accepter ou refuser un sortie.	PO2	12	R
CO2	Raconter un souvenir, Exprimer le fait d'aimer et de ne pas aimer, Interroger sur un souvenir.	PO2	12	U
CO3	Decrire un logement, Louer un logement, Exprimer sa deception, Consoler, reconforter.	PO4	12	AP
CO4	Faire le portrait physique de quelqu'un, Faire un compliment, Parler du caractere de quelqu'un.	PO4	12	AN
CO5	Parler du futur, imaginer l'avenir, Decrire l'utilite d'un objet, Exprimer sa surprise, Exprimer un espoir..	PO7	12	C

**UNIT – 1: Nouvelles vies - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 2: Je me souviens - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 3: Comme a la maison - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 4: Tous pareils, tous different - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 5: En route vers le futur ! - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**Text Books:**



EDITO – NIVEAU A2- Methode de francais | Edition: 2 | Les Editions Didier | Caroline Sperandio | Clemence Fafa | Florence Gajdosova | Alexandra Horquin | Airelle Pasquet | Marion Perrard | Violette Petitmengin| Marlene Dodin (DELF) | Julie Veldeman-Abry (Phonetique) | (April, 2022)

### Reference Books:

**R1.** Larousse – Dictionnaire bilingue | Edition: 2 | Hachette | MARIANNE DURAND (2006)

**R2.** Collins dico | Edition: 8 | MAURY-IMPRIMEUR SA MALESHERBES, FRANCE.

Harper co | MARIANNE DURAND (2006)

### Website Links:

i) [wordreference.com](http://wordreference.com) ii) [verb2verbe.com](http://verb2verbe.com) iii) [tolearnfrench.com](http://tolearnfrench.com)

Course Title : English III(T)	Course Code :
Semester :III	Course Group :ELN III
Teaching scheme in Hrs(L:T:P) : 4:0:0	Credits :3
Map Code :A (LANGUAGE CONCEPTS)	Total Contact Hours :60
CIA :25Marks	SEE : 75Marks
Programme :All II UG Courses	<b>#-SemesterEndExam</b>

No.	Course Outcomes (Cos): After completion of this course, the students will be able to	PSOs	CL. Ses	CL
CO1	Broaden their outlook and sensibility and be acquainted with cultural diversity and divergence in perspectives.	PSO1	15	AP
CO2	Be updated with basic informatics skills and attitudes relevant to the emerging knowledge society	PSO1, PSO2	15	U
CO3	Produce grammatically and idiomatically correct language	PSO4, PSO6	15	AP
CO4	Gain knowledge in writing techniques to meet academic and professional needs.	PSO4, PSO5, PSO6	15	R
CO5	Be equipped with sufficient practice in Vocabulary, Grammar, Comprehension and Remedial English from the perspective of career oriented tests.	PSO3, PSO8	8	R

## UNIT I: POETRY

LECTURE HOURS:12

**1.1 The Voice of the Mountains -Mamang Dai-** 'The Voice of the Mountain' by Mamang Dai talks about a young man. He brought a fish as an offering to the spirit of the mountain as he couldn't speak. The person thought if the mountain took pity on him, he would grant his voice back. According to the mountain, such acts of pleasing him are repeated.

**1.2 Sita- Toru Dutt-** In the poem "Sita" the poet Toru Dutt conjures up the mythic past and tries to infuse into it the past glory. She gives a picture of Sita in exile. What fascinates the reader is her description of nature in which flowers, lakes, peacocks, and a herd of deer find a place.

**1.3 A Song of Hope – Oodgeroo Noonuccal-** The poem 'A Song of Hope' revolves around the dark history of Australia where discrimination and slavery were shown to the Aboriginal People. But unlike most poems 'A Song of Hope' like its name positively talks about a brighter and fairer future for the coming generations of Aboriginal People.

**1.4 In an Artist's Studio - Christina Rossetti-** Christina Rossetti's sonnet, 'In an Artist's Studio', is broadly concerned with the tensions between art and reality. Specifically, these tensions arise from the relationship between the male artist and the artist's female model, the gazer and the gazed-upon.

## UNIT II: SCENES FROM SHAKESPEARE

LECTURE HOURS:12

**2.1 Romeo & Juliet -The Balcony Scene-** At the start of this scene, Romeo hides beneath Juliet's balcony and overhears her talking about him. He eventually comes out and they talk to each other. They declare their love for each other and arrange to meet the next day when Romeo has promised to marry Juliet.

**2.2 Macbeth-Banquet Scene-** In this scene, Macbeth and Lady Macbeth host a banquet for the Scottish thanes. A murderer tells Macbeth that he has been successful in killing Banquo, but that Fleance escaped. During the banquet, Macbeth sees the ghost of Banquo sitting at his place at the table. He is horrified.

**2.3 Julius Caesar - Murder Scene-**In this scene Caesar refuses to read Artemidorus' warning. Cassius has a moment of panic and fears the plot has been discovered but Brutus reassures him. The conspirators surround Caesar, pretending to kneel in appeal, and Caesar is stabbed to death by all the conspirators.

## UNIT III: SPEECHES OF FAMOUS PERSONALITIES

LECTURE HOURS:12

**3.1 Tryst with Destiny- Jawaharlal Nehru-** This speech was delivered on the midnight of 14th August 1947 to the Indian Constituent Assembly in the Parliament. Tryst with Destiny focuses on restoring the glory of

India and rebuilding after the destruction caused by British rule. The speech's central aspect was addressing ignorance, poverty and health.

**3.2 Yes, We Can-Barack Obama-** “Yes, we can” is a popular repetition in President Obama's speeches. This phrase shows his political power and strong authority to address the weakened era of the US to inspire and motivate citizens towards progress and prosperity.

**3.3 You’ve Got to Find What You Love-Steve Jobs-** Jobs considered work as his first love always and here's what he said in his speech, "You've got to find what you love. And that is as true for your work as it is for your lovers. Your work is going to fill a large part of your life, and the only way to be truly satisfied is to do what you believe is great work.

#### **UNIT IV: LANGUAGE COMPETENCY**

**LECTURE HOURS:12**

**4.1 Writing letters and emails-** Different types of letters- Informal letter- Formal letter- E-mail writing introduction- Things to remember while writing an E-mail- Writing an effective E-mail.

**4.2 Writing and messaging in social media platform-** Writing methods for each social media platforms- Instagram- Twitter- Facebook- LinkedIn

**4.3 Learning netiquette, email etiquette-** Introduction to netiquette- Rules of netiquette- Introduction to E-mail etiquette- Importance of E-mail etiquette- Rules for E-mail etiquette.

#### **UNIT V: ENGLISH FOR WORKPLACE**

**LECTURE HOURS:12**

**5.1 Data Interpretation and Reporting-** Introduction to data interpretation- Steps involved in interpretation- Precautions in interpretation- Meaning of research report- purpose or functions of research reports- Characteristics of a good research report- Writing style of report.

**5.2 Data Presentation and analysis-** Introduction to data presentation- Types of data presentation- Steps involved in presenting data- Data analysis process

**5.3 Meeting Etiquettes** – Introduction to meeting etiquette- Importance of meeting etiquette- Rules for proper meeting etiquette

**Online Meetings** - Terms and expressions used

**5.4 Conducting and participating in a meeting-** Introduction- Rules for conducting effective meeting- Disciplines for participating in a meeting.

#### **Text Books :**

T1. Natarajan K. *Enlightening English Prose*. New Century Book House, 2011.

T2.Rathnasabapathi K. *Developing Language Skills through Literature -I*. Sunitha Printers,2016.

T3.Robb, Cuthbert W. *Representative Anthology: English Essays*. Blacky Books, 2011.

#### **Reference Books:**

R1. Mohan, Krishna and Banerjee, Meena. *Developing Communication Skills*. Macmillan India, 1990.

Course Title	: <b>ENZYMOLGY</b>	Course Code	: 43 B
Semester	: <b>III</b>	Course Group	: <b>DSC-V</b>
Teaching Scheme in Hrs (L:T:P)	: <b>4:0:0</b>	Credits	: <b>6</b>
MapCode	: <b>C(THEORY)</b>	Total Contact Hours:	<b>60</b>
<b>CONCEPTS)</b>			
CIA	: <b>25 Marks</b>	SEE	: <b>75Marks</b>
Programme: <b>BSC-BC- BIOCHEMISTRY</b>			

No.	Course Outcome (Cos): After completion of this course, the students will be able to	POs & PSOs	Cl. Ses	CL
CO1	Describe the Nomenclature and Classification of enzymes according to International Union of Biochemistry (IUB) and Explain the salient features and models of active sites of enzymes.	PSO 1	12	U
CO2	Distinguish the enzyme kinetics and different types of enzyme inhibition inenzyme catalytic reaction.	PSO 2	12	An
CO3	Categorize the structure and functions of different Coenzymes and the role of coenzymes in various metabolic reaction.	PSO 2	12	An
CO4	Construct the methods of Enzyme Immobilizations and its applications in various Industrial aspects.	PSO 3	12	Ap
CO5	Identify the various types of enzyme biosensor and its application in different clinical aspects.	PSO3 & PSO4	12	Ap

### **UNIT- I : ENZYME :INTRODUCTION AND CLASSIFICATION:**

Enzyme: Introduction – (Properties and History) & Nomenclature - According to IUB system. Digit number, Suffix “ase” Classification - Six main classes, (Definition & suitable examples) Active site- (Introduction & Mode of action) - Salient features of active site residues. Binding sites and catalytic sites. Lock and Key model

– (Definition, mechanism & diagrammatic presentation) Induced fit model – (Definition, mechanism & diagrammatic presentation)

### **UNIT -II : ENZYME KINETICS:**

Steady state theory – (Introduction, Rate of formation of ES, Graph) Michaelis-Menton equation,  $K_m$  - Michaelis constant.- (Introduction and Derivation.) LB Plot - LB Plot Graph. Hanes plot - Based on the MM equation. (Introduction & Derivation) Enzyme inhibition & factors affecting enzyme activity – (Introduction and Mechanism) Reversible inhibitors, Irreversible inhibitors. Competitive, Non- competitive & Uncompetitive inhibition – (Mechanism with examples) Effect of various factors affecting enzyme activity - Vital role in metabolic regulation. (Substrate, enzyme, temperature & PH, Saturation point,  $V_{max}$ ,  $K_m$ , Optimum PH & Temperature)

### **UNIT-III : CO ENZYME :**

Coenzyme :(Introduction and Properties) Nicotinamide coenzymes -  $NAD^+$  and  $NADP^+$ - (Structure and Function) .Flavin nucleotides - FMN and FAD- (Structure and Function) TPP – Thiamine Pyro Phosphate- (Structure and Function). PP- Pyridoxal Phosphate- (Structure and function) Biotin- (Structure and Function) Folic acid- (Structure and Function) Isoenzymes- (Introduction and properties) Multienzyme complex – (Definition & examples) Pyruvate dehydrogenase – (Mechanism & reactions)

### **UNIT-IV : ENZYME IMMOBILIZATION**

Enzyme Immobilization (Introduction – Definition.) Methods of immobilization – (Principle and Types) Adsorption, Covalent bonding, Cross linking. Encapsulation, Entrapment, Advantage of immobilization process – (Advantage in immobilization techniques in industry aspects ) Applications of immobilized enzymes – (Components of analytical systems, continuously operated process)

### **UNIT-V : APPLICATION OF ENZYMES :**

Role of enzyme in medicine - Treatment of various diseases (Asparaginase, Collagenase, Urokinase, Streptokinase) Food and drink industries – (Baking of bread, brewing industries.)Other industries – (Washing powders, Immobilized glutamate dehydrogenase linked to alcohol dehydrogenase) Role of enzymes in Free Radical Scavenging – (SOD, GSH Reductase, Catalase, Etc.) Enzyme Biosensor: Introduction – (Definition and Principle) Types and Applications - Colorimetric, Optical & immunosensor. (Principle and application) Enzyme in Industrial aspects – (Role in Food & Textile industry)

### **Text Books :**

T1 - Fundamentals of Enzymology | Edition:2 | Oxford Science Publications, Newyork. | Nicholas c. price, Lewis stevens 2019

T2 - Enzymes - Biochemistry, Biotechnology, Clinical chemistry. | Edition:3 | East west Press Pvt Ltd,New Delhi. | Trevor Palmer. and Philip bonner (2020)

### **Reference Books :**

R1 – Lehninger Principles of Biochemistry, David. L.Nelson, Michael M. Cox . Eight edition ,2021.

R2- Harper’s Illustrated Biochemistry, Victor Rodwell, David Bender, Kathleen Botham and PeterKennelly, Thirty First Edition -May-2018.

Course Title	: <b>ENZYMOLOGY</b>	Course Code : 43Q
Semester	: <b>III</b>	Course Group : <b>DSC-V</b>
Teaching Scheme in Hrs (L:T:P)	: <b>0:0:4</b>	Credits: <b>2 Credits</b>
Map Code	: <b>H(PRACTICAL EXPERIMENTS)</b>	Total Contact Hours <b>60</b>
CIA	: <b>40 Marks</b>	SEE : <b>60 Marks</b>
Programme: <b>BSC-BC</b>		

### List of experiments

1. Determine the pH on the activity of Salivary Amylase
2. Determine the Temperature on the activity of Salivary Amylase
3. Determine the pH on the activity of Alkaline Phosphatase
4. Determine the Temperature on the activity of Alkaline Phosphatase
5. Determine the pH on the activity of Catalase
6. Determine the Temperature on the activity of catalase
7. Determine the pH on the activity of Acid Phosphatase
8. Determine the Temperature on the activity Acid Phosphatase
9. Determine the SOD Enzyme activity
10. Determination of GSH Reductase activity

Course Title : <b>Bioenergetics &amp; Metabolism</b>	Course Code : 33B
Semester : <b>III</b>	Course Group : <b>DSC-VI</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:4:0</b>	Credits : <b>4 Credits</b>
Map Code : <b>C(THEORY CONCEPTS)</b>	Total Contact Hours <b>60</b>
CIA : <b>25 Marks</b>	SEE : <b>75 Marks</b>
Programme: <b>BSC-BC</b>	

No.	Course Outcome	POs & PSOs	Cl. Ses	CL
CO1	Discuss the general design of metabolic pathways based on bio energetic principle involved in carbohydrate metabolism, Glycolysis, Glycogenesis & Glycogenolysis.	PSO 1	12	U
CO2	Categorize the process the mechanisms involved in Electron Transfer.	PSO 2	12	U & An
CO3	Understanding the process of Biosynthesis of fatty acid & oxidation in lipid metabolism	PSO 2	12	R & U
CO4	Illustrate the process involved in the metabolism of protein.	PSO 2	12	U & An
CO5	Describe the structure of nucleosides & nucleotides and to understand the base pairing of the nucleotides.	PSO 3	12	U

### UNIT-I

Bioenergetics-High energy compounds: Role of high energy compounds, free energy hydrolysis of ATP and other organophosphates, ATP-ADPcycle.

Biological Oxidation: Electron transport chain -its organization and function. Inhibitors of ETC. Oxidative phosphorylation, P/Oratio, Peter Mitchell's chemiosmotic hypothesis. Mechanism of ATP synthesis, uncouplers of oxidative phosphorylation, substratelevel phosphorylation with examples.

Carbohydrate metabolism -Glycolysis (Pathway and Energetics). TCA cycle – (Pathway and

Energetics).Glycogenolysis-(Reactions of Glycogen phosphorylase, Glycogen transferase and Glucose phosphatase).Glycogenesis –(Reactions of Glucokinase, Formation of UDPG glucose, Glycogen synthase). Gluconeogenesis- (Reactions of Transamination, Deamination, Propionate metabolism).HMP shunt – (Oxidative and non oxidative phase reactions).

## **UNIT-II**

Metabolism of carbohydrates -Glycolysis, TCA Cycle, Amphibolic nature and integrating role of TCA cycle. Anaplerosis, Pentose Phosphate Pathway (HMP shunt), Gluconeogenesis, Glycogenesis, Glycogenolysis and its regulation, glyoxylate cycle, Entner- Doudoroff pathway and Cori cycle.

## **UNIT-III**

Metabolism of lipids -Oxidation of fatty acids -  $\alpha$ ,  $\beta$  and  $\omega$  -oxidation of saturated fatty acids, Oxidation of fatty acids with odd number of carbon atoms and unsaturated fatty acids, Ketogenesis, Biosynthesis of saturated fatty acids and unsaturated fatty acids, Biosynthesis and degradation of triglycerides, phospholipids and cholesterol.

## **UNIT-IV**

**Protein Metabolism –(General reactions of amino acid - Deamination, Transamination, Decarboxylation).**

**Metabolism of Aromatic Amino acid**

**Urea cycle – (Reactions and intermediates of urea cycle).Catabolism of carbon skeleton of amino acids- (Glycogenic and ketogenic).Integration of metabolism – (Interrelation between Carbohydrate, Fat and Protein metabolism).**

## **UNIT-V**

**Nucleic acids (Introduction - Nucleosides & Nucleotides).Metabolism of Purines (Biosynthesis of purine nucleotides Denovo synthesis - Synthesis of purines AMP & GMP from ribose 5 phosphate).Biosynthesis of purine nucleotides salvage pathways – (Conversion of purines their nucleosides & their deoxyribonucleotides into mononucleotides).Metabolism of pyrimidines –(Biosynthesis of pyrimidine nucleotides- Denovo synthesis).Biosynthesis of pyrimidine nucleotides-( salvage pathways).**

Metabolism of nucleotides-Biosynthesis of purines and pyrimidines, - denovo synthesis and salvage pathways, Degradation of purines and pyrimidines, Conversion of ribonucleotide to deoxyribonucleotide

Metabolism –(Metabolism- Concepts of anabolism and catabolism)

### **Text books:**

1. Fundamentals of Biochemistry, 2017 J.L.Jain, S.Chand publications.
2. Principles of Biochemistry, 2011 Nelson, David.I and Cox, M.M.Macmillian worth, NY.
3. Textbook of Biochemistry, 1995 Lubert Stryer, 4<sup>th</sup> Edition, W.H.Freeman & Co. (New edition)
4. Biochemical Methods 2014, Sadasivam and A. Manickam, Second Edition. (New



edition)

5. Laboratory Manual in Biochemistry 2013, J.Jayaraman

#### Reference books

1. Textbook of Biochemistry, Harper, Robert K.Murray, Daryl k.Graner, Peter A.Mayes Rodwell,2018, Rev edition.
2. Principles of Biochemistry, Zubay Geoffrey, McGraw publishers, 2017, 5<sup>th</sup> edition.
3. Textbook of Biochemistry, 2016 Lubert Stryer, 4<sup>th</sup> Edition, W.H.Freeman & co.

Course Title : <b>Bioenergetics &amp; Metabolism</b>	Course Code : 33Q
Semester : <b>III</b>	Course Group : <b>DSC-VI</b>
Teaching Scheme in Hrs (L:T:P) : <b>0:0:4</b>	Credits : <b>2 Credits</b>
Map Code : <b>H (THEORY TECHNOLOGY)</b>	Total Contact Hours: <b>60</b>
CIA : <b>40 Marks</b>	SEE : <b>60 Marks</b>
Programme: <b>BSC-BC</b>	

1. Estimation of Total Carbohydrates by Anthrone method.
2. Estimation of Glycogen by Anthrone method.
3. Estimation of Iron by Wong's method.
4. Estimation of Hydrogen peroxide by colorimetric method.
5. Determination of Total cholesterol from blood sample by KIT method.
6. Extraction of lecithin from egg yolk.
7. Separation of Glycine, Methionine by TLC method.
8. Estimation of Urea by DAM – TSC method.
9. Separation of DNA by Agarose Gel Electrophoresis.
10. Estimation of RNA by Orcinol method.

Course Title : <b>ALLIED CHEMISTRY</b>	Course Code : 33E
Semester : <b>II</b>	Course Group : <b>DSE-I</b>
Teaching Scheme in Hrs (L:T:P) : <b>6:0:0</b>	Credits : <b>6 Credits</b>
Map Code : <b>C(THEORY CONCEPTS)</b>	Total Contact Hours : <b>90</b>
CIA : <b>25 Marks</b>	SEE : <b>75 Marks</b>
Programme: <b>BSC-BC</b>	

No	Course Outcome (Cos): After completion of this course, the students will be able to	Pos & PSOs	Cl. Ses	BLOOM'S TAXONOMY LEVEL
CO1	Understand the basics of thermodynamic laws and principle	PO1& PS01	15	U
CO2	Demonstrate the different aspects of chemical bonding	PO1& PS01	15	Ap
CO3	Describe the basic rules of organic nomenclature	PO1& PS01	12	U
CO4	Demonstrate titrimetry experiments and assessments of important factors that could affect the analytical result.	PO1& PS01	12	Ap
CO5	Analyse the concepts of physical chemistry	PO1& PS01	12	An

### **UNIT-1 (LECTURE HOURS: 15)**

#### Thermodynamics

Thermodynamics - Introduction (Definition, Energy changes and Importance of Thermodynamics), Types of system (Open, Closed and Isolated), Types of process (Reversible, Irreversible and isothermal), Properties (Extensive and intensive), Laws of thermodynamics (First law and Second law, Enthalpy and Entropy), Free energy (Definition, Spontaneity, Gibbs free energy)

### **UNIT-2 (LECTURE HOURS:15)**

#### Chemical bonding theory

Structure of atoms and molecules ( Introduction), Types of chemical bonds (Ionic, Covalent, and Coordinate), Hybridization (Introduction, Salient Features of Hybridization, Shapes of hybrid orbital), Structure and polarity of water (Hydrogen Bond in Water, Buffer Solutions and Preparations)

### **UNIT-3 (LECTURE HOURS: 12)**

#### Organic chemistry theory

Organic chemistry (Introduction, Classification, Nomenclature), Isomers and Isomerism ( Types and Molecular Formula), Stereoisomerism (Definition and Classification - Optical and Geometric isomerism), Cyclic, Acyclic and Heterocyclic compounds (Introduction, Classification, Structure of Monocyclic, Acyclic and Heterocyclic compounds)

### **UNIT-4 (LECTURE HOURS: 12)**

#### Volumetric methods theory

Solution (Definition of Ideal and Non-ideal Solutions, Units of Concentration, Molecular Weight, Equivalent Weight, Molarity, Molality, Normality, PPM and Percentage solution), Concepts of volumetric analysis ( Introduction, Analysis and Titrant), Principles of acid base titration –(Introduction - Acids, Alkalies, Indicators and Buffers ), Titration ( Strong acid vs strong base, weak

acid vs strong base, weak base vs strong acid), EDTA titration (Introduction , indicators for EDTA titration)

### **UNIT-5 (LECTURE HOURS: 12)**

Physical chemistry theory

Electrochemistry(Definition, Electrolytes, Conductance, Equivalent Conductance, Specific Conductance, Molar conductance),Surface chemistry (Adsorption, Adsorbents, Physisorption and Chemisorption, Colloids, Gels, Emulsions, Electro Osmosis, Inhibition),Environmental chemistry (Concept and Scope of Environmental Biochemistry)

### **TEXTBOOK**

1. B.R. Puri, L.R. Sharma and Madhan S. Pathania, Principles of physical chemistry, (2017), Vishal Publishing Co.
2. B.S. Bahl and Arun Bahl (2014) A textbook of organic chemistry , S.Chand and Co.Ltd.
3. Principles of Inorganic chemistry | Edition:25 | Shobinlalnagin Chand & Co | Puri&Sharma(2014)
4. Text book of Organic Chemistry | Edition:28 | Sultan chand& sons | H.M. CHAWLA AND P.L. SONI (2014)

### **Reference Books:**

1. Industrial chemistry | Edition:10 | Goel Publishing House Meerut, India | 2.B.K. SHARMA (2007) Chemistry | Edition:4 | Houghton mifflin company new york
2. M.Satake, Y.Hayashi(2003), Colloidal and Surface chemistry, Discovery publishing house

# SEMESTER IV

	Course Opted	Course Name	D	L	T	P	CI A	ES E	Mark s	Credit s
<b>IV</b>	MIL – IV	Tamil - IV	3	4	-	-	25	75	100	3

Course Title : <b>TAMIL IV ( T )</b>	Course Code : 41T
Semester : <b>IV</b>	Course Group : <b>MIL - IV</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : 3
Map Code: <b>A ( Language- Concepts)</b>	Total Contact Hours: <b>60</b>
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>ALL UG PROGRAMMES</b>	<b>Semester End</b>

No.	Course Outcomes (Cos): After completion of this course, the students will be able to	POs	CL. Ses	CL
CO1	புறநாடுகளைப் பற்றி அறிந்துகொள்ளும் திறன் பெறும்.	PO7	15	U
CO2	புறநாடுகளைப் பற்றி அறிந்துகொள்ளும் திறன் பெறும்.	PO2	12	R
CO3	புறநாடுகளைப் பற்றி அறிந்துகொள்ளும் திறன் பெறும்.	PO8	13	AP
CO4	புறநாடுகளைப் பற்றி அறிந்துகொள்ளும் திறன் பெறும்.	PO2	10	AP
CO5	புறநாடுகளைப் பற்றி அறிந்துகொள்ளும் திறன் பெறும்.	PO1	10	R

அலகு I - எட்டுத்தொகை

பாடவேளைகள் - 15

- நற்றிணை - தோழி கூற்று- ((உடன் போக்குக்கு தோழி தலைவியை அகப்படுத்தியது - சோழர்கள் மிகுந்த வெற்றி உடையவர்கள் - கொங்கரை அகப்படுத்தியவர்கள் - பறையன் வரலாறு - அதுபோல தலைவி நல்ல இளமை உடையவள் வரலாற்றுப் பாடல்.)
- பாலை - மாழலனார் - (இயற்புடந்த தோழிக்கு தலைவி இயற்பட மொழிந்தது - தலைவன் நிகழ்வைக் கூறுதல் - தோழிகளிறுமலை பாம்பின் வகைப்பட்டது -யானை-பெண் யானை பிடியது அந்த ஒளி - மழையெங்கும் பரவியது அது-போல் தலைவியின் காதலும் ஊரெல்லாம் தெரிந்தது.)
- பாலை- தலைவன் கூற்று - சிறைக்குடி ஆந்தையார் - (யார் தலைவன் தன் நெஞ்சுக்கு உணர்த்தியது - பொருளைத் தேடிச் சென்றால் காதல் இருக்காது - காதலை நாடினால் பொருள் தேட முடியாது - என் நெஞ்சமே தலைவியை பிரிவதல் - இருந்தால் உன்னை நான் பிரிய வேண்டும் பொருள் புணர்வு பிரிவு என்ற மூன்று சொற்களும் உலகம் தழுவியது)

குறுந்தொகை

1. பாலை -தோழி கூற்று -பாலைபாடிபெருங்கடுங்கோ - (ஆறலைக்கள்வரின்றும்பு- ஆண் பல்லியெண் பல்லியின் துணைத்தேடுதல்-தலைவன் வருவார் - நம்பிக்கை தலைவிக்கு உண்டு.)

2. குறிஞ்சி - தலைவன் கூற்று - பேரையின்மூருவளார் - (தோழி குறைமாறாமல் கூறியது காமம் மீதியுற்றால் பனை மடலால் குதிரையினை கொண்டுஆடவர் அதன் மேல் செல்வர் - எருக்கம்பூ மாலை அடையாளமாகக் கொள்வர் - வீதியில் பரத்தமை கண்டுஆவதிக்கப்படுவார்-அது வரைபாய்தற்குரிய செயலாகும்.)

3. மருதம் - தலைவன் கூற்று - பரணர்((மழையில் அரளிமலர்கள் மணம் பரப்பல் - தலைவிநறக்கு எத்தகைய - உறவு உடையவன்எவ்வி என்ற மன்னனை இழத்தல்-வறுமையுடைய யாழ்ப்பாணர்-அதுபோல பொலிவிழத்தல்.)

4. குறிஞ்சி - தலைவன் கூற்று - கபிலர் (தலைமைகண்டுதோழிக்குச் சொல்லியது தலைவன் என்னை கனவில் மணந்து கொண்டான் அதற்கு சாட்சியுருவரும் இல்லை திணையின் அடியைப் போன்ற சிறிய நாரையானது மீளின் வரவை எதிர்பார்ப்பதுபோல எங்களை கண்டது அதுவே சாட்சி)

5. குறிஞ்சி - தலைவன் கூற்று - அவ்வையார்- (நெஞ்சினை நோக்கி கூறியது நல்ல உரைகளை உடைத்து பயனற்ற முறைகள் பெற்று மழை நீரை எதிர் கொள்ளும் பசுமனை போல என் உள்எத்தில் பசுமனை உயர்ந்த மறக்கிளையில் பெண் குரங்கு குட்டிகளை தழுவது போல என் கருத்து நின்றவேறும் பெற்றால் வரைவு எளிதாகும்.)

வெல்லும் நீந்துகின்றது

6. குறிஞ்சி - தலைவி கூற்று - கபிலர் (தலைமைகண்டுதோழிக்கு கூறியது மயில் பாறையில் என்ற மூட்டையை குரங்கு குட்டிகள் உருட்டி விளையுமே அதையின் நினைவுக்கு தலைவன் மீளாது தட்டி உள்ள

6.

கண்ணின் மூரும் நீரோடு என்னை பிரிந்தால் அவன் வரவு எண்ணிகாத்திருக்கிறேன்.)

1. கலித்தொகை - பாலைக்கலி - (மணந்து கொள்ள வருவான் தோழி வரவிமழிந்து கூடியது சிவபெருமான் உமையையுடன் கைலையில் ஸீற்றிறுத்தல் ராவணன் அம்மலையை இழுத்தல் அது போன்று வேங்கை மரத்தை குத்தி என்பது யானை நாட்டை உடையவன் தலைவன் நீர் இல்லாத நிலத்தில் பயிர் போல் என் அன்பு இல்லாத பொலிவிட்டு இருக்கிறான் மழை பெற்ற காலத்தில் பயிர் விளைவது போல இவனும் உன்னை நாடி வருவார் கையில் பொருள் இல்லாதவங்கு இளமை போல் நீ நண்பன் கிட்ட பெறாதது அறநெறி பொருந்தாத வீணே முதுமை அடைகிறான் உன் அருள் பெறாமல் இவன் பொலி வருகிறான் மறைச்சாரலில் உண்டான வழியில் வருகிறாய் என் வருத்தத்தை நான் தலைவனுக்கு கூறினேன்.)

2. குறிஞ்சிக்கலி - கபிலர் - (நகைக்கூட்டம் செய்தான் கள்வன் மகன் தலைவி தோழிக்கு கூறியது ஒளியுடைய வளையலை அணிந்த தோழியை கேட்பாயாக தெருவில் மணலால் செய்த வீட்டை தன் காலால் கலைத்து மலர் மாலை அறுத்தும் பந்து எடுத்துக் கொண்டு ஓடியும் இதை விளையாட்டுகளை செய்பவர்க்குக் கட்டங்குதவன் முன்னாள் நாள் என்னை பிழைக்கு வந்தவன் நீருணாவிரும் பினால் பொய்பொன்னாளான களத்தில் நீரை கொடுத்தேன் அவன் என் வளையல் அணிந்து உன் கையை பற்றி நான் உரக்க சத்தமிடாள் தாய் ஓடிவந்தால் இவன் தண்ணீர் லிக்கல் எடுக்க வருந்தினான் என்றேன் அப்போது கள்வன் மகன் தன் கலைக்கண்ணால் என்னை நோக்கி நான் புன்மூலால் என் உள்ளத்தில் புகுந்தான்.)

1. அகநானூறு - பாலை மாமூலனார் - (நகர்போக்கியத்தாய் சொல்லியது தோலையும் அணை மாணையான் வருந்தும்படி என்னை கைவிட்டு சென்றால் நன்னன் என்ற குளுநில மன்னனின் தலைநகரம் பாலிநகரம் போன்ற காவல் நிலையம் தன் துணைவினைத்தால் மகன் சென்றால் மரத்தின்புதிய பூக்களை உடைய ஒன்றை பூக்களை போல என் மகனும் சென்றால் அவன் சென்ற நிதிநகரிகள் கூட்டும் பறந்து செல்லும் இயல்புடையது நான் மெய்மை பேசியதால் கோசலின் திறந்த முக்கியத்து இன்னும் மகன்களை உடையவனும் தோசையுடைய இனமான மயிர்கள் மிக்க சோழர்கள் உடைய துளநாட்டை போன்று புதிய வணாபிறக்கும் பண்பு இல்லாததாக இருக்கின்றேன்.)

2. பாலை - மதுரை அழகர் ஞானம் கனம் மள்ளனார் - (நெஞ்சே வினைவையின் போதும் வா பொருளால் உண்டாகும் நன்மை எடுத்துக் கோரி தலையில் வீட்டில் இருக்கிறான் அவனை பெரிய இயலாது இப்போது இடைவெளியில் வந்த பின்பு தலைவனும் செல்ல எண்ணுகின்றாய் அன்றே பிரியாத இருப்பின் நன்று இவ்வளவு தொலைவில் வந்து நாம் மேற்கொள்ள செயலை விளக்குவாயானால் பிறரால் எண்ணி நகையாடுவோம்).

3. பாலை - மாமூலனார் - (தலைமுகர் கிறங்கிய தாய் தெருட்டும் அயலிலாட்டிக்கு உரைத்தது. கதிரால் வெப்பம் உண்டாகி பாலை நிலமான வரண்டு இருக்கின்றது பறவைகள் வருத்தப்பிற்கு காரணமாகிறது வெப்பம் அடியில் வருத்துகின்றது ஞாட்டில் வழி ஆண் யானை போன்ற தலைவர்கள் என் மகள் சென்றாள் யார் மகளைப் பிரிந்து இருந்து உலகில் ஒதும் துருத்தியைப் போல இருக்கிறேன் ஒளிபரந்திய படை உடையவன் கரிகாலன் அவன் எண்ணிப் போர்க்களத்தில் புறப்பண்ணிற்கு பெரிதும் ஞானமடைந்தான் செயலாள் தான் தோல்வி அடைந்த போர்க்களத்தில் வடக்கு நோக்கி உயிர்த்தெழுந்தான் அதுபோல என் உயிருடன் மாறுபட்ட நான் இங்கனம் வருந்துகிறேன்).

1. புறநானூறு - மாறோக்கத்து நப்பசலையார் - (புறாவின் துன்பத்தை போக்கிய படை விரும்பிய சிவி சோழன் மறைவில் வந்தவனே - ஐந்து தலை உடைய சின்னம் கொண்டு பாம்பு புருந்தது போல் வானமான தீய தோற்றுவித்தது - பச்சையான குடிகளை உடைய மலைப் பக்கத்தில் இடி இடிப்பது போல மிகுந்த - அகலியையும் நீர் வைக்க மடுவையும் கொண்ட பழைய ஊரில் யானையுடைய அரசு உள்ளதால் அவற்றை நல்லவை என்று பாராது - போரில் அழிக்க கூடிய வல்லமை பெற்றவனே).

2. புறநானூறு - திணைவாகை - காவல்பெண்டு - (செவிலித்தாய் வயிற்றில் தூண்டுபற்றி கொண்டு என் மகன் எங்கே இருக்கிறாய் என்று வினவல் - பெண்டின் மகன் புலி சோர்ந்து போகிய கற்களைப் போல அவன் போர்க்களத்தில் தோன்றுவான் அனைக்காண் விரும்பினால் அங்கு சென்று காண்பாயாக் என்தாய் உரைக்கின்றாள்)

3. புறநானூறு - வேள்பாரி - கபிலர் (பொதுவியல் துறை மூவேந்தரும் இந்நாட்டை முழு நிலா நாளில் முற்றியுள்ளனர். - என் தந்தையுடையாய் இருந்தோம் - இத்திங்களில் இம்மலையைக் கொள்ளவுமில்லை - என் தந்தையை இழந்தோம் - பாரி மகளின் வருத்திப்பாடுதல்).

## அலகு II - பத்துப்பாட்டு

பாடவேளைகள் - 12

நெடுநல்வாண்டாடுக்கீரர் - பாண்டியன் நெடுஞ்செழியன் - (கோவலர் வாடையால் துன்புறுதல் - கூதிர்கால நிலை - மாக்கள் தெருக்களில் கூற்றுதல் - மாலைக்காலம் - பெண்கள் தெய்வத்தை வணங்குதல் - கோடி வாயில் முற்றமும் முள்வாயிலும் - அரண்மனையில் எழும் ஓசைகள் - அந்தப்புரத்தின் அமைப்பு - வட்டக்கட்டில் - அரசி படுக்கையில் கீற்றிருத்தல் - செவியலியர் தலைவினைத் தேற்றுதல் - தலைவியின் வருத்தம் மிகுதி - பாசறையில் அரசன் நிலை).

## அலகு III - நாடகம்

பாடவேளைகள் - 13

1. இரண்டாவது பெருவிரல் - ஆதிராமன் - (காட்டில் வேயர்கள் - துரோணரும் தருமரும் உரையாடல் - அர்ச்சுனன் மீன் உரையாடல் - ஏகலைவன் - துரியன் - துரோணர் உரையாடல் - வில்விதையில் ஏகலைவன் - வேடர் குலம் - வேடர்களும் ஏகலைவனும் - போர்க்களம் - துரோணரும் துரியனும் உரையாடல் - கண்ணனும் அர்ச்சுனனும் உரையாடல் - ஏகலைவன் வெற்றி).

2. புரட்சிக்கவி - மு. இராமசாமி - (இகைக்குழு வருகை - ஒயிலாட்டிக்குழு வருகை - கனகப்புரத்தினம் - கவிதை - புரட்சிக்கவி - பாரதிதாசன் பாடல் - உதாரன் வருகை - அரசன் கலைஞர்களை சிறப்புச் செய்தல் - தளபதியின் பேச்சு - அரசர் மகள் அமுதவள்ளி - உதாரன் அமுதவள்ளிக்கு தமிழ் கற்றுக்கொடுத்தல் - உதாரன் பெரியோர்களுடன்



உரையாடல் - மக்கள் உதாரணை ஏற்றுக்கொள்ளல் - உதாரன் அமுதவள்ளி காதல் - அரசன் குழ்ச்சி - மக்கள் புரட்சி - அனைவரும் சமம்). குடும்ப உரையாடல் - வீதி நாடக ஒத்திகை - மருத்துவப் பரீட்சை - இப்பள்ளத்திலும் பழகும் சூபா இலக்கிய நூல்கள் தகாசிராஜன் மகன் - சுயம்வரம் - விசித்திர வீரியன் - அம்பா - சால்வா - ரௌத்திரம் பழகுதல்)

அலகு IV - இலக்கிய வரலாறு

பாடவேளைகள் - 10

- 1.. சங்க இலக்கியங்கள் - (எட்டுத்தொகை நூல்கள் - நற்றிணை - குறுந்தொகை - ஐங்குறுநூறு - பதிற்றுப்பத்து - பரிபாடல் - கலித்தொகை - அகநானூறு - புறநானூறு ஆகியவை பற்றிய குறிப்புகள்.)
- 2.. சங்க இலக்கியங்கள் - (பத்துப்பாட்டு - ஆற்றுப்படை நூல்கள் - நெடுநல்வாடை - குறிஞ்சிப்பாட்டு - முல்லைப்பாட்டு - மலையடுகடாம் ஆகியவை குறித்த செய்திகள்.)
3. நாடகத்தின் தோற்றமும் வளர்ச்சியும் (நாடக இலக்கியம் - நாடக வகைகள் - துப்பறியும் நாடகம் - சமூக நாடகம் - பக்தி நாடகம் - தமிழில் தோன்றி நாடகங்கள் - பம்மல் சம்பந்த முதலியார் - சங்கரதாஸ் ஸ்வாமிகள் - டிகேஎஸ் சகோபர்கள் - அண்ணாத்துரை - கலைஞர் முதல் இன்றை நாடக ஆசிரியர்கள் வரை குறிப்புகள்.)

அலகு V - மொழித்திறன்

பாடவேளைகள் - 10

1. மொழிபெயர்ப்பு மற்றும் கலைச்சொற்களை அறிமுகப்படுத்துதல் = (ஆங்கிலத்தை தமிழில் மொழிபெயர்த்தல் - அலுவலைக் கடிதம் - தமிழில் மொழிபெயர்த்தல் (சுற்று அரசு சார் கடிதங்கள் நிறுவனம் சார் கடிதங்கள்)

பார்வை நூல்கள் :

1. தமிழிலக்கிய வரலாறு - மு. வரதராசன்
2. வகைமையியல் நோக்கில் தமிழிலக்கிய வரலாறு - முனைவர் பாக்கியமேரிஷ்
3. சங்க இலக்கியத் தொகுப்பு அறிமுகம் - வர்த்தமானன் பதிப்பகம்
4. தமிழ் நாடக இலக்கியம் - ப. பாலசுப்பிரமணியம்
5. மொழிபெயர்ப்பியல் - தி. சு. நடராசன்

	Course Opted	Course Name	D	L	T	P	CI A	ES E	Marks	Credits
IV	MIL - IV	HINDI-IV	3	4	-	-	25	75	100	3

SEMESTER-IV

Course Title : <b>HINDI-IV (T)</b>	Course Code : 24H
Semester : <b>IV</b>	Course Group : <b>MIL - IV</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : 3
Map Code: <b>A ( Language- Concepts)</b>	Total Contact Hours: <b>60</b>
CIA: <b>25 Marks</b>	SEE # : <b>75</b>
Programme: <b>ALL II YEAR UG PROGRAMMES</b> <span style="float: right;"><b>Semester End</b></span>	

### Exam

No	Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	Class Session	CL
CO1	Describe & getting knowledge of computer terms in Hindi	PO3	12	U
CO2	Categorize the difference between Devanagari Script and Unicode and its application	PO1	12	AP
CO3	Providing of different operations & its usage of Hindi in different govt. offices	PO8	12	R
CO4	Detect & Know about E-Patrikas	PO3	12	AN
CO5	Getting & apply the knowledge of Competitive exams through online	PO1	12	AP

### UNIT I

**LECTURE HOURS: 12**

**Computer aur Hindi:**(computer me hindi ka gyankaisebadana, ComputerkaParchayaurVikas, Computer mein Hindi ke Vividh Font jaise ki kruti dev, mangal ariel aadi ka gyanbadana,)

**UNIT II****LECTURE HOURS: 12**

**Proudyogiki aur Hindi:**(Unicode, DewanagariLipi, Hindi ki Vibhinna Website – EkParichay, Wikipedia kepratigyanbadana)

**UNIT III****LECTURE HOURS: 12**

**Computer kemadhyam se Hindi:**(shikshanaur E-Learning, Vibhinna E-Learning Sansadhan, Sarkari aur gairsarkarisansthanonmeinprayukt Hindi Bhasha

Computer kemadhyam se Hindi shikshanaur E-Learning

Sarkariaurgairsarkarisansthaomeinprayukt Hindi Bhasha)

**UNIT IV****LECTURE HOURS: 12**

**VividhPaksh, Internet par Hindi:**(patra-patrikaye, Hindi SMS, Hindi Tankan, Hindi keVibhinna Key-board, hindikevibhinn app ko ka parichaydena, khud)

**UNIT V****LECTURE HOURS: 12**

**Pratiyogipriksha par aadharit:**(Computer sambandhitprashik, Hindi meinPowerpoint bananaHindi mein Google Document taiyarkarna, Hindi mein Google form taiyarkarna, Vibhinnapratyogiparikshaoke bare meinsuchnapradankarna)

**Text & Reference Books**

- Social Networking: Naye Samay ka Samvad – Ed. Sanjay Dwivedi
- Jansancharaur Maas Culture – Jagdeeshwar
- Media: Bhumandalikaran au rSamaj – Ed. Sanjay Dwivedi
- NayeJamanekiPatrakarita – Sourabh Shukla
- Patrakarita se Media tak – Manoj Kumar

Semester	Cours e Opted	Course Name	D	L	T	P	CI A	ES E	Mark s	Credit s
I	MIL - IV	Malayalam – IV	3	4	-	-	25	75	100	3

**MALAYALAM****ACADEMIC YEAR 2023-2024**

Course Title : MALAYALAM – IV (T)	Course Code : 24M
Semester <b>IV</b>	Course Group <b>MIL - IV</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : <b>3 Credits</b>
Map Code: <b>A (Language Concept)</b>	Total Contact Hour : 60
CIA : <b>25 Marks</b>	SEE : <b>75 Marks</b>
Programme : <b>II Yr ALL UG PROGRAMMES</b>	# - <b>Semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	Class Session	CL
CO1	Operate: Photo editor, Web designer, Graphic designer, DTP, Operator Logo, Designer, Digital illustrator, Pattern Maker, Stationary Designer etc	PO3	12	AP
CO2	Interpret the different styles of photoshops	PO3	12	U
CO3	Apply different images and layouts for invitationmaking	PO2	12	AP
CO4	Explain the style of caption writing	PO4	12	U
CO5	Interpret the style of contemporary high-resolution technology for brochure making	PO3	12	U

**UNIT - I****LECTURE HOURS: 12****Desktop Publishing and Printing in Malayalam**

(This unit introduces basic of the printing technology and Data entering, DTP editing and layout. Book publishing. Significance ISBN, and ISSN)

**UNIT - II****LECTURE HOURS: 12****Desktop Publishing and Printing in Malayalam**

(About the limits of MS Paint - Presentation and setup of user interface and help Open and save an image - Knowledge of available file types (JPG, TIFF, ICO, PNG, GIF...) -Set opened image as desktop wallpaper - Display options (zoom, miniature grid, etc.) -Define or resize the size of an image (nonfunctional transparency), Drawing tools overview, Colors selection with right click/left click in the palette, Copy/Paste from selection with or without transparency, insert an external image in a composition Working for different image and resolution and changing the resolution. Editing photographs from our own albums & images Scanning images, and how to assimilate color tones)

**UNIT - III****LECTURE HOURS: 12****Desktop Publishing and Printing in Malayalam**

(Painting & editing tools Painting tools painting tool options, paintbrush tool, brushes palette, creating a new brush, undo, history brush tool, art history brush tool, gradient tool, paint bucket tool. Drawing tools Drawing basic geometric shapes, custom shape tool. Editing tools Blur tool, sharpen tool, smudge tool, clone stamp tool, pattern stamp tool. Toning tools Dodge tool, burn tool. Eraser tools 129 Eraser tools, background eraser tool, magic eraser tool, slice tool.)

**UNIT - IV****LECTURE HOURS: 12****Desktop Publishing and Printing in Malayalam**

(Layers Layer palette Working with layers, creating a new layer, selecting, hiding/showing, deleting, sorting, repositioning, merging, linking and transforming layers, layers effects, rotating skewing, flipping & distorting layer. This unit introduces the Layers Layer palette

Working with layers, creating a new layer, selecting, hiding/showing, deleting, sorting, repositioning, merging, linking and transforming layers, layers effects, rotating skewing, flipping & distorting layer)

**UNIT - V**

**LECTURE HOURS: 12**

**Desktop Publishing and Printing in Malayalam**

(Proofreading techniques and cataloging, cove designing, blurbwriting)

**TEXT BOOKS:**

- T1.** pusthaka nirmaanam - The state language Institute,Kerala
- T2.** Proff reading our kala- The state language Institute,Kerala
- T3.** Printing A to Z - K.J. Sam kutti
- T4.** ini vaayana E vayana- V.K. Adarsh, D.C. books,Kottayam
- T5.** Print Technology and Compositing- The State Language Institute, Kerala
- T6.** Bookstologia- P.K. Rajasekharan- Mathrubhumi books
- T7.** Pusthakam Untakunnathu- V.K. Haridas, PoornaPublications, Kozhikode
- T8.** An Introduction to Book Publishing - D Raghavan
- T9.** Copy Editing- Judith Butcher

**REFERENCES:**

- R1.** E Malayalam/cyber Malayalam - Sunitha T.V.
- R2.** [https://www.amazon.com/Desktop-Publishing-Bittu- Kumar/dp/9350570130](https://www.amazon.com/Desktop-Publishing-Bittu-Kumar/dp/9350570130)

Serial	Course	Course Name	D	L	T	P	CI	ES	Mark	Credit
	Opted									
V	MIL-IV	French-IV	3	4	-	-	25	75	100	3

Course Title : <b>FRENCH-IV (T)</b>	Course Code : <b>41 F</b>
Semester : IV	Course Group : MIL-IV
Teaching Scheme in Hrs (L:T:P) : 4:0:0	Credits 3
Map Code : A (Language Concept)	Total Contact Hours : 60
CIA : 25 Marks	SEE# : 75 Marks
Programme: <b>ALL II YR UG PROGRAMMES (Except CS&amp;HM) # - Semester End Exam</b>	

No.	Course Outcome(Cos): After completion of this course, the students will be able to achieve the following outcomes.	POs	Class Session	CL
CO1	Comprendre des instructions de cuisine, Mettre en garde, Communiquer au restaurant, Exprimer sa satisfaction et son insatisfaction.	PO2	12	R
CO2	Donner un conseil, Parler des problemes de sante, Exprimer son point de vue.	PO2	12	U
CO3	Exprimer sa preference, Exprimer son interet, Faire une critique positive ou negative.	PO4	12	AP
CO4	Exprimer un souhait, un desir, Donner un conseil, Demander et proposer un service.	PO4	12	AN
CO5	Structurer son propos, Demander des renseignements sur un voyage, Parler d'une visite touristique, Exprimer et repondre a l'agacement.	PO7	12	C

**UNIT – 1: En cuisine - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 2: A votre sante ! - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 3: Dans les medias - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 4: Consommer responsable - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**UNIT – 5: Envies d’ailleurs ? - (Lecture Hours: 12 Hrs)**

- Communication** - (Translation & Comprehension Passages)
- Grammaire** - (Grammar Exercises)
- Vocabulaire** - (Vocabulary Exercises)
- Culture & Francophonie** - (Information about French Culture & Francophone Countries)

**Text Books:**

EDITO – NIVEAU A2 - Methode de francais | Edition: 2 | Les Editions Didier | Caroline Sperandio | Clemence Fafa | Florence Gajdosova | Alexandra Horquin | Airelle Pasquet | Marion Perrard | Violette Petitmengin | Marlene Dodin (DELF) | Julie Veldeman-Abry (Phonétique) | (April, 2022)

**Reference Books:**

- R1.** Larousse – Dictionnaire bilingue | Edition: 2 | Hachette | MARIANNE DURAND (2006)
- R2.** Collins dico | Edition: 8 | MAURY-IMPRIMEUR SA MALESHERBES, FRANCE. Harper co | MARIANNE DURAND (2006)

**Website Links:**

i) [wordreference.com](http://wordreference.com) ii) [verb2verbe.com](http://verb2verbe.com) iii) [tolearnfrench.com](http://tolearnfrench.com)



Course Title: <b>CLINICAL BIOCHEMISTRY &amp; CLINICAL LAB TECHNOLOGY</b>	Course Code :
Semester: <b>IV</b>	Course Group : <b>DSE - IV</b>
Teaching Scheme in Hrs. (L: T): <b>4:0:4</b>	Credits :4
Map Code: <b>C (THEORY)</b>	Total Contact Hours: 60
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>BSC-BC</b>	# - <b>Semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to	Pos & PSOs	Cl.Ses	CL
CO1	Describe the basic concepts of clinical biochemistry.	PO1& PS01	12	R
CO2	Discuss the disorders of carbohydrate metabolism	PO1& PS01	12	U
CO3	Criticize disorders of aminoacids and nucleic acid metabolism	PO1& PS01	12	An
CO4	Infer on disorders of lipid metabolism	PO1& PS01	12	U
CO5	<i>Apply on various hematology techniques</i>	PO1& PS01	12	Ap

#### UNIT I

##### BASIC CONCEPTS OF CLINICAL BIOCHEMISTRY

Specimen collection and processing (blood, urine and feaces), anti-coagulant and preservatives for blood and urine. Transport of specimens) Hematology (Total and differential counting of leukocytes). Preparations of solutions Laboratory glassware and its uses. Concept of universal precautions, bio-hazard. Handling of waste, waste segregation and management including disposal, Laboratory accidents, prevention, first aid. Aseptic techniques, sterilization, and disinfection. Different types of blood samples.

#### UNIT II

##### DISORDERS OF CARBOHYDRATE METABOLISM

Homeostasis (Regulation of blood sugar) Diabetes mellitus and Diabetes insipidus (hypoglycemia, hyperglycemia fasting blood glucose and post pandrial glucose level). Ketonuria, ketosis. Galactosemia (causes, symptoms and treatment) Glycosuria (types of glycosuria) Glycogen storage disease (introduction, types, clinical manifestation, symptoms and treatment).

#### UNIT III

##### DISORDERS OF AMINOACIDS AND NUCLEIC ACID METABOLISM

Phenyl ketonuria, Cystinuria, alkaptonuria, and Tyrosinemia( Etiology and clinical manifestation) Maple syrup urine disease (MSUD) (Etiology and clinical manifestation and treatment) Hartnup disease (Etiology and clinical manifestation and treatment) Fanconi syndrome, (Etiology and clinical manifestation and treatment) Albinism,( Etiology and clinical manifestation)

DISORDER OF PURINE METABOLISM (Hypo and Hyperuricemia (Etiology and clinical manifestation) Gout (types clinical manifestation and treatment).

DISORDER OF PYRIMINDINE METABOLISM Orotic acid uria (Etiology and clinical manifestation and treatment)

#### UNIT IV

##### DISEASES RELATED TO LIPID METABOLISM:

Disorder associated with lipoproteins Hyperlipoproteinemia & amp; hypo protein lipoproteinemia

**(Introduction, clinical manifestation and treatment)**

**Atherosclerosis (Introduction, clinical manifestation and treatment) Fatty liver (Introduction, clinical manifestation and treatment) Lipid storage disease Tayssach's disease (Introduction, clinical manifestation and treatment) Niemann - Pick diseases (Introduction, clinical manifestation and treatment)**

## **UNIT V**

### **HEMATOLOGY**

**Introduction to hematology, Normal constituents of Blood, their structure and functions Collection of Blood samples, Anticoagulants, mechanism of action and uses. Hemoglobin estimation, different methods and normal values, Packed cell volume, Erythrocyte sedimentation rate, Normal Haemostasis, Bleeding time. Clotting time, prothrombin time, WBC- morphology, functions, normal count, differential count, Platelets- origin, morphology, normal count, function Platelet plug, bleeding disorder**

### **CELL COUNT**

**Basics of hemocytometer, counting chambers-Different types of counting chambers-RBC pipette -WBC pipette -Basics of differential count for WBC using flow cytometer Microscope- Parts of microscope, working of microscope, types of microscopes- Phase contrast, inverted microscope, fluorescent microscope.**

### **BLOOD BANK**

**Introduction blood banking, Blood group system, Blood group-ABO & Rh system, Rh incompatibility blood typing, cross matching, hazards of mismatched blood transfusion Collection and processing of blood for transfusion, Compatibility testing, Blood transfusion reactions**

### **Reference book**

**R1. M.N. Chatterjee & Ranashinde, Text Book of Medical Biochemistry. Jaypee Brothers Medical Publisher (P) Ltd. 6th edition (2006).**

**R2. Carl A. Burtis, Edward R. Ashwood and David E. Bruns (eds), Tietz Textbook of Clinical Chemistry and Molecular Diagnosis. 5th edition, 2012.**

#### **Text Books**

**T1. Thomas M. Devlin, Biochemistry with clinical correlation. John Wiley & Sons. 7th Ed, 2010.**

**T2. Allan Gaw, Michael J. Murphy, Rajeev Srivastava, Robert A. Cowan, Denis St. J. O'Reilly, Clinical Biochemistry, 5th edition, 2013.**

**T3. Graham Basten, Introduction to Clinical Biochemistry, Interpreting Blood Results. Book Boon. 2nd edition, 2011.**

Course Title: <b>CLINICAL BIOCHEMISTRY &amp; CLINICAL LAB TECHNOLOGY</b>	Course Code :
Semester: <b>IV</b>	Course Group : <b>DSE - IV</b>
Teaching Scheme in Hrs. (L: T): <b>4:0:4</b>	Credits :4
Map Code: <b>C (THEORY)</b>	Total Contact Hours: 60
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>BSC-BC</b>	# - <b>Semester End Exam</b>

#### List of Experiments

1. Separation of serum and plasma from blood
2. Estimation of hemoglobin concentration in blood
3. Estimation of Glucose by anthrone method
4. Estimation of Glycogen by anthrone method
5. Estimation of Creatinine
6. Estimation of serum Albumin
7. Estimation of serum Cholesterol
8. Estimation of urea by TSC DAM method method
9. Estimation of RNA by orcinol method.

Course Title : <b>Molecular Biology</b>	Course Code : 43A
Semester : IV	Course Group : <b>DSC-VII</b>
Teaching Scheme in Hrs (L:T:P) : <b>4:0:0</b>	Credits : <b>4 Credits</b>
Map Code : <b>C(THEORY CONCEPTS)</b>	Total Contact Hours : 60
CIA : <b>25 Marks</b>	SEE : <b>75 Marks</b>
Programme: <b>BSC-BC</b>	

No	Course Outcome (Cos): After completion of this course, the students will be able to	Pos & PSOs	Cl.Ses	BLOOM'S TAXONOMY LEVEL
CO1	Understand the scientific process in the content of learning the fundamentals of molecular biology.	PO1 & PS01	12	U
CO2	Explain the experimental process in the compounds of molecular biology.	PO1 & PS01	12	R
CO3	Gain knowledge about DNA replication, DNA repair mechanism and mutation.	PO1 & PS01	14	Ap
CO4	Explain the mechanism of transcription	PO1 & PS01	14	R
CO5	Understand the mechanism of translation	PO1 & PS01	12	U
CO6	Acquire the knowledge about gene regulation.	PO1 & PS01	10	AN

**UNIT-I (LECTURE HOURS: 18)**

Introduction

DNA, RNA, Protein and Central dogma

Organization of eukaryotic chromosome

Fundamental unit of chromatin. Types and properties of histones. Chromatin assembly. DNA carries genetic information, Transformation, Transduction, Conjugation, Griffith's experiment, Avery's experiment and Hershey-Chase experiment.

**UNIT-II (LECTURE HOURS: 18)**

DNA Replication: DNA Replication, semi conservative mechanism, The Meselson – Stahl experiment, enzymology

of DNA replication, initiation, elongation and termination. DNA repair mechanism: excision repair, mismatch repair and SOS response. Inhibitors of DNA replication. Mutation: spontaneous and induced mutation.

**UNIT-III (LECTURE HOURS: 18)**

Transcription: Central Dogma, Synthesis of RNA, DNA dependent RNA Polymerase, sigma factor, association of RNA polymerase with DNA, initiation, elongation, termination of transcription, post transcriptional modification of RNA, reverse transcription, RNA directed RNA polymerase

**UNIT-IV LECTURE-IV HOURS: 18)**

Translation: Genetic Code: Features of genetic code, chemical composition of eukaryotic and prokaryotic ribosomes, and activation of amino acids, initiation, elongation and termination of protein synthesis in prokaryotes, post translational modification of proteins and inhibitors of protein synthesis.

**UNIT-V (LECTURE HOURS: 18)**

Gene Regulation: Regulation of gene expression in E.coli. Terminology in regulation of gene expression. Types of control of operons ,lactose operon in E.coli, negative regulation and positive regulation, lac operon, arabinose operon and tryptophan operon and its regulation.

Text Books

1. Ajoy Paul (2007),Text Book of Cell and Molecular Biology, Books and allied Pvt.Ltd. Kolkata.
2. G.P. Jayanthi(2009), Molecular Biology, MJP publishers, Chennai
3. Vasudevan D.M, Sreekumari S and Kannan Vaidyanathan, (2011), Text Book of Biochemistry for Medical Students,6th ed., Jaypee Brothers Medical Publishers Pvt. Ltd., New Delhi,110002.

Reference Books

1. Karp's Cell & Molecular biology , Gerald Karp, Janet Iwasa, Wallace Marshall, 9<sup>th</sup> Edition, 2019.
2. Molecular Cell Biology, Harvey Lodish, 8<sup>th</sup> Edition, 2018.
3. Molecular biology of the Gene, Watson, Steitz, Hopkins,Roberts, 4<sup>th</sup> Edition , 2016.

Course Title	: <b>MOLECULAR BIOLOGY</b>	Course Code	: 43P
Semester	: IV	Course Group	:
Teaching Scheme in Hrs (L:T:P)	: <b>0:0:4</b>	Credits	: <b>2 Credits</b>
Map Code	: <b>H ( Practical)</b>	Total Contact Hours:	60
CIA	: <b>40 Marks</b>	SEE	: <b>60 Marks</b>
Programme: <b>BSC-BC</b>			

LIST OF EXPERIMENTS:

1. Isolation of genomic DNA from bacterial cell
2. Isolation of genomic DNA from plant cell
3. Isolation of genomic DNA from whole blood
4. Agarose gel electrophoresis
5. Spectrophotometric estimation of isolated DNA
6. Plasmid DNA isolation by alkaline lysis method
7. Restriction digestion of DNA
8. Elution of DNA band from
9. Polymerase chain reaction
10. Sodium dodecyl sulfate -polyacrylamide gel electrophoresis

Course Title: <b>BIostatISTICS</b>	Course Code : 43E
Semester: <b>IV</b>	Course Group : <b>DSE - II</b>
Teaching Scheme in Hrs. (L: T): <b>4:0:4</b>	Credits :6
Map Code: <b>C (THEORY)</b>	Total Contact Hours: 72
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>BSC-BC</b>	<b># - Semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	BLOOM'S TAXONOMY LEVEL
CO1	Understand the basic concept of data analysis, data collection method and statistical computing.	PSO 1	12	Understand
CO2	Apply statistical knowledge in the statistical distribution to design and conduct research studies about hypothesis testing	PSO 1&PSO 2	12	Understand
CO3	Understand the basic principles of probability, descriptive statistics, and data analysis.	PSO 2	12	Understand
CO4	Understand linear relationships, outliers, and the basics of correlation.	PSO 3	12	Understand
CO5	Understand the difference between correlation and simple linear regression, and when to apply one or the other.	PSO 3	12	Understand

## UNIT I

### **Introduction to Biostatistics**

Basic concepts - Definition and functions

### **Collection of data**

Primary data and secondary data - Methods of collection of data

### **Classification and tabulation**

Classification - Objectives and types

Tabulation - Roles of table, parts of table and roles of tabulation

### **Diagrammatic and graphical representation**

One dimensional diagram - Bar diagram and its types, pie diagram

Diagrammatic representation - Pictogram, cartogram

### **Activity**

- 1) preparation of chart work in pie diagram and bar diagram

## UNIT II

### **Measures of central tendency**

Mean - Related problems

Median - Related problems

Mode - Related problems

Measures of dispersion Range - Related problems

Quartile deviation - Related problems

Standard deviation - Related problems

### **Activity**

- 1) Group Discussion on relationship between mean, median and mode standard deviation.

## UNIT III

### **Sampling**

Methods of Sampling - Theory and related problems

Simple random sampling - theory and related problems

Stratified random sampling - theory and related problems

Systematic sampling - theory and related problems

Cluster sampling - theory and related problems

Sampling and non sampling error - theory and related problems

### **Activity :**

- 1) Practical performance of sampling

## UNIT IV

### **Test of hypothesis**

P. Value - Related Problems

Significant level - related problems

Confidence Interval - Related Problems

Test of significance - Procedure and errors

Chi square test - Related problems

F distribution - Related problems

### **Analysis of variance**

One way ANOVA - Related problems

Two way ANOVA - Related problems

### **Activity:**

- 1) Preparation of chart for testing hypothesis

## UNIT V

### **Correlation**

Definition - Basic concepts and types

Methods- Scatter diagram - Related problems

Karl Pearson Co efficient of correlation and rank correlation - Related problems

### **Regression**

Definition - Basic concepts

Construction of regression equation - Related problems

### **Activity:**

- 1) Case study based on correlation of academic performance of students before and after attending Slow learners and peer support program

Text Books:

1. Statistical methods | Edition:49 | Sultan Chand & Sons Educational Publishers | Dr S.P.Gupta(2018)
2. Basic Biostatistics | Edition:30 |New Age Publication | B. Burt Gerstman (21 February 2018)

Reference Books:

1. Research Methodology methods and Techniques | Edition:2 | New Age Publications | Kothari CR(2017)
2. Statistics theory and practice | Edition: 8 | Chand and Co | Bagavathi AND Pillai (2014)

### SEMESTER - IV

Course Title : <b>APTITUDE</b>	Course Code : 44F
Semester <b>IV</b>	Course Group : <b>AECC – II</b>
Teaching Scheme in Hrs (L:T:P) : <b>3 :0:0</b>	Credits : <b>3</b>
Map Code : F ( <b>PROBLEM – ANALYSIS</b> )	Total Contact Hours: <b>45</b>
CIA : <b>100 Marks</b>	SEE # : -
Programme: <b>All II UG PROGRAMMES (EXCEPT CS &amp; HM)</b>	<b># - Semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to	POs	Cl. Ses	Bloom's Taxonomy Level
<b>CO1</b>	Recall the Numbers, H.C.F and L.C.M and apply the problems on number simplification and the ability to face the test and interview conducted by different companies and succeed.	<b>PO5 &amp; PO6</b>	<b>9</b>	AP
<b>CO2</b>	Illustrate the Percentage, Profit and Loss, Simple and Compound Interest and solve them.	<b>PO5 &amp; PO6</b>	<b>9</b>	AP
<b>CO3</b>	Understand and Solve the Ratio, Problems on ages, Time & Distance and also prepare to appear in different competitive exams.	<b>PO5 &amp; PO6</b>	<b>9</b>	AP
<b>CO4</b>	Practice the problems on Trains, Time and Work. It will enhance students problem-solving skill.	<b>PO5 &amp; PO6</b>	<b>9</b>	AP
<b>CO5</b>	Understand and solve logical thinking and analytical abilities.	<b>PO5 &amp; PO6</b>	<b>9</b>	AP

#### UNIT- I

**LECTURE HOUR: 9**

Types and Process of Numbers (Vedic Mathematics) - HCF and LCM (Test of divisibility and Factors and Multiples)–Numbers Simplification (Short cut methods) -Average (Important Facts and Formulas).

#### UNIT- II

**LECTURE HOUR: 9**

Percentage (Concept of Percentage) - Simple and Compound Interest (Important facts such as principal and interest) – Profit and Loss (Important facts such as Cost Price and selling Price).

#### UNIT- III LECTURE HOUR: 9

Ratio (Ratio of two quantities, the equality of two ratios and Variation) – Problems on ages (Related Problems) - Time and distance (Important facts such as speed, Distance, time and ratio between them).

#### UNIT- IV

**LECTURE HOUR: 9**

Problems on trains (Related problems) -Time and Work (Important facts and formulas)

#### UNIT- V

**LECTURE HOUR: 9**

Direction Test (Related problems) -Blood Relations (Related problems) -Number Series (Related



problems) -Coding and Decoding (Related problems).

### **ASSESSMENT**

Objective type Question pattern.

### **TEXTBOOKS:**

1. Ronak Bajaj, Vedic Mathematics, Black Rose Publications, 2005.
2. Agarwal. R.S, Quantitative Aptitude, S Chand & Company Pvt Ltd R.S, Revised Edition 2008.

### **REFERENCE BOOKS:**

1. Bharati KrsnaTirthaji, Maharaja, Vedic Mathematics, Motilal Banarsidass Publishers Private Ltd, Delhi, Re-Print 2004.
2. Agarwal. P.K Test of Reasoning and Quantitative Aptitude, S Chand & Company Pvt Ltd, 2005.
3. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, Tata McGraw Hill, 3rd Edition, 2011.
4. Edgar Thrope, Test of Reasoning for Competitive Examinations, Tata McGraw Hill, 4th Edition, 2012.
5. Interview Guide, RVS Educational Trust, Third Edition, 2019.

# SEMESTER - V

Title : <b>GENETIC ENGINEERING</b>	Course Code : 63B
Semester: <b>VI</b>	Course Group : <b>DSC - IX</b>
Teaching Scheme in Hrs (L:T) : <b>4:0:4</b>	Credits :4
Map Code: <b>C(THEORY)</b>	Total Contact Hours: 48
CIA: <b>25 Marks</b>	SEE # : <b>75 Marks</b>
Programme: <b>BSC-BC</b>	# - <b>Semester End</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	BLOOM'S TAXONOMY LEVEL
CO1	Learn the basic techniques and experiments to explain the genetic material and to understand the structure, organization, types and functions.	PS01	10	U
CO2	Analyze the various enzymes which manipulate the range of DNA	PS01	10	An
CO3	Understand the replication of DNA	PS01	10	U
CO4	Understand the basic need of Genomics and Proteomics and to analyze the transformation of Genes.	PS01	10	An
CO5	Analyze the changes occur in DNA base pairing and to study about the repair mechanism.	PS01	8	An

## **UNIT – I**

### Chemical Basis of Heredity:

DNA as genetic material, Experiments of Griffith - Avery, Mc Cleod; Mc Carthy and Harshey Chase.

RNA as genetic material- Experiment of Fraenkel and Singer.

### Genome organisation and Fine structure of the Gene :

Prokaryotic genome:- Chromosomal and plasmid

Eukaryotic genome:- Chromosomal and organellar

Fine structure of the Gene: Cistron, muton and recon

## **UNIT – II**

### The range of DNA manipulative enzymes

DNA polymerase, Polynuceotide kinase - Functions

T4 DNA ligase - Joining DNA molecules

Terminal deoxynucleotidyl I transferase - Functions

Reverse transcriptase and Topoisomerase - Functions

Restriction endonucleases Type I, II & III - Characteristics of Type II Restriction endonuclease, nomenclature, restriction sites

### DNA Replication:

DNA Replication in prokaryotes and rolling circle model

DNA Replication in eukaryotes

## **UNIT – III**

### Gene Expression:

Genetic code: Brief account.

Protein synthesis in prokaryotes and eukaryotes.

Transcription (“rho” dependent and “rho” independent termination)

Post Transcriptional modifications

Translation

Regulation of Gene expression:-

Inducible operons – Galactose

Repressible operon – Tryptophan **UNIT – IV**

**Bacterial Genetics :**

Transformation,

Transduction-Generalized and specialized:

Conjugation: F factor mediated, Hfr and Sexduction.

**Introduction to Genomics and Proteomics**

Genes and Proteins, Polymorphisms – types of polymorphism

**UNIT – V**

**Transposable elements :**

Maize and Drosophila

**Mutations:**

Introduction and Types of Gene mutations - Base substitution,

Frame shift mutation (insertion, deletion, missense, nonsense mutation).

Mutagens - Physical and chemical.

Reverse mutation in bacteria.

DNA repair mechanism (Mismatch repair photoreactivation, excision and SOS repair)

Beneficial and harmful effects of mutations.

Vectors

Text Books :

T1-Gene Cloning by T.A.Brown | Edition:5 | BlackWell Publishers, London | T.A.Brown(2006)

T2-Principles of Gene ManipulationEdition | Edition:3 | Blackwell Scientific Publication | S.B.Primrose AND R.W.Old (2006)

T3-Biotechnology | Edition:3 | Book and Allied Kolkata | U Sathyanarayan (2005)

T4-From Genes to Clones | Edition:2 | Panima Publishers | E.L.Winnecker(2003)

T5-Genes VI | Edition:3 | Oxford University Press | B.Lewin(2000)

T6-Recombinant DNA technology and molecular cloning | Edition:2 | Scientific American  
Publication Black well publica | Kary B. Mullis (1996)

T7-Immunology | Edition:5 | WH Freeman andcompany NY | Richard AGold boy AND  
Thomas JKindt(2003)

Reference Books :

R1-Molecular Cloning | Edition:3 | Cold Spring Harbour laboratory | KaarenAJanssen AND  
NinaIrwin(2001)

Course Title : <b>GENETIC ENGINEERING</b>	Course Code : 63Q
Semester : V	Course Group : <b>DSC-IX</b>
Teaching Scheme in Hrs (L:T:P) : <b>0:0:4</b>	Credits : <b>2</b>
Map Code : <b>H</b>	Total Contact Hours: <b>48</b>
CIA : <b>40 Marks</b>	SEE : <b>60 Marks</b>
Programme: <b>BSC-BC</b>	

### List of Experiments

1. Mitotic division in onion root tip.
2. Isolation of plasmid DNA from plant leaves
3. Isolation of genomic DNA from plant leaves
4. Quantification of DNA using spectrophotometric method
5. Transformation of bacteria using CaCl<sub>2</sub> heat shock method
6. Resolution and molecular weight estimation of fragmented DNA using agarose gel electrophoresis
7. DNA Denaturation
8. RNA Denaturation

Course Title : IMMUNOLOGY	Course Code :
Semester : V	Course Group : DSC-X
Teaching Scheme in Hrs (L:T:P) : 4:0:0	Credits : 4 Credits
Map Code : C(THEORY CONCEPTS)	Total Contact Hours : 60
CIA : 25 Marks	SEE : 75 Marks
Programme: BSC-BC	

No.	Course Outcome	POs & PSOs	Cl. Ses	CL
CO1	Describe the concept of immune system to safeguard against infection	PSO1	12	U
CO2	Illustrate and outline the antigen and antibody structure, types, function and immunological reactions.	PSO1	12	R & AN
CO3	Predict and analyze immuno techniques to analyze the antigen and antibody reactions	PSO1	12	Ap&AN
CO4	Interpret the different types of hypersensitivity and various immunological disorders	PSO1 & PSO3	12	Ap
CO5	Discuss and relate the significance of different vaccines and sketch the importance of organ transplantation and its impact of rejection	PSO1 & PSO3	12	U & Ap

#### UNIT-I (Lecturer hours 12)

##### Immunology

Introduction to Immunology (Definition and general principles of Immunology), Innate immunity and Acquired immunity (Physiological, genetic, anatomic and inflammatory Live and attenuated vaccines, Active and Passive), Antibody mediated immune response (Primary and secondary immune response), Cell mediated immune response (Lymphocytes), Primary lymphoid organs (Thymus and Bone Marrow), Secondary lymphoid organs (Spleen, Lymph node), Cells of immune system (RBC, WBC, NK CELLS), Structure and function (Neutrophils, eosinophils, basophils, macrophages and phagocytes)

#### UNIT-II (Lecturer hours 12)

##### Antigen

Introduction ( Definition and Types Properties, Specificity, cross reactivity, antigenicity, immunogenicity Chemical nature Epitope, haptens, adjuvant, super antigen Introduction ( Definition and properties)

Structure and function (Light Chain, Heavy Chain, Hinge region, Disulphide bonds), Class and



subclass (Ig G, Ig A, Ig M, Ig E & Ig D), Clonal selection theory (Response of B cells to antigen) antigen- antibody reactions (Primary, Secondary and Tertiary - Precipitation and agglutination experiments).

complement system Introduction (Definition and mechanism of formation), Complement pathway (Components and pathway)

UNIT-III(Lecturer hours 12)

Measurement of antigen and antibody combination

Introduction (Introduction of diffusion and agglutination methods) , Immunodiffusion (Types Radial immuno diffusion, double immuno diffusion). Immuno electrophoresis (Principles and techniques), agglutination (Types Slide and Table agglutination), Widal test (Method) immunological test Application RIA, ELISA, monoclonal antibodies

UNIT-IV(Lecturer hours 12)

Allergy and hypersensitivity

Types I & II (Mechanism and clinical manifestation), Types III & IV (Mechanism and clinical manifestation)

immunological disorders Autoimmune diseases (Rheumatoid Arthritis and Myasthenia Gravis), Immuno-deficiency disease (AIDS)

Pulmonary infection (Covid 19 mode of infection)

UNIT-V (LECTURE HOURS: 12)

Transplantation immunology

Introduction (Allograft rejection and Graft vs Host diseases), Allograft rejection (Mechanism of graft rejection), Rejection to tumors (tumors rejection)

Vaccination Types of immunization (Active and Passive immunization), Types of vaccines (Recombinant DNA vaccines and Edible vaccine), Effects ( Benefits and adverse effects of vaccination), COVID Vaccines

Text Books :

1. Kuby Immunology | Edition:8 | W.H. Freeman Publishers | Jenni Punt AND Judy Owen AND Patricia Jones AND Sharon Stranford(2019)
2. Immunology | Edition:4 |saras publication| N.Arumugam, Dulsy Fatima (2019)
3. The immune system | Edition: 4 | Peter Parham (2021)

Reference Books :

1. Immunology | Edition:4 | Elsevier publishers | David B RothIvanRoitt AND David Male AND Jonathan Brostoff(2018)
2. Immunology | Edition:4 |saras publication| N.Arumugam, Dulsy Fatima (2019)

Course Title :IMMUNOLOGY (P)	Course Code :
Semester V	Course Group : DSC-X
Teaching Scheme in Hrs (L:T:P) : 0:0:4	Credits : 4 Credits
Map Code : H (PRACTICAL - EXPERIMENTS)	Total Contact Hours : 48
CIA : 25 Marks	SEE : 75 Marks
Programme: BSC-BC	

### LIST OF EXPERIMENTS

1. Separation of serum and plasma from blood sample
2. Estimation of WBC
3. ASO latex test
4. RA test
5. Rocket immunoelectrophoresis
6. WIDAL test
7. Estimation of uric acid
8. ELISA test
9. Vaccine DPT techniques
10. Immuno diffusion Methods
11. Single immuno diffusion
12. Double immuno diffusion
13. RIA
14. Western Blotting
15. Anti inflammatory Kit method
16. CRP
17. Haemagglutination

Course Title : HEALTH MANAGEMENT	Course Code :
Semester : V	Course Group : EDC

Teaching Scheme in Hrs (L:T:P) : 5:1:0	Credits: 6Credits
Map Code : C (THEORY CONCEPTS)	Total Contact Hours :90
CIA : 25 Marks	SEE# : 75 Marks
Programme : B.SC., BIOCHEMISTRY	

No	Course Outcome (COs): After completion of this course, the students will be able to	Pos &PSOs	Cl.Ses	BLOOM'S TAXONOMY LEVEL
CO1	Understand the equity in health, to reduce health risk and to promote healthy lifestyle.	PO1 & PS01	18	U
CO2	Illustrate the different types of diabetes and their possible causes	PO1 & PS01	18	An
CO3	Summarize the pathology and prevention of cardiovascular diseases.	PO1 & PS01	18	U
CO4	Explain the formation of kidney stones and to overcome through diet.	PO1 & PS01	18	U
CO5	Identifying the healthcare operations during COVID-19	PO1 & PS02	18	R

## UNIT I

(LECTURE HOURS: 18)

Health

Concept of health - Definition, Quality of life, and Hygiene.

Food factors - For human being and their requirements Calorific value of food - Values of different nutrients.

Obesity related diseases - Definition and classification, genetic and environmental factor leading to obesity & Management of obesity

UNIT II (LECTURE HOURS: 18)

Diabetes

Diabetes - Definition,

Types of diabetes - IDDM, NIDDM, Gestational Diabetes and blood sugar level

Insulin and glucagon - Definition, effect of hormone levels in diabetes

Etiology and pathogenesis - Occurrence and symptoms Management of diabetes - Diet and medicine

### UNIT III (LECTURE HOURS: 18)

Cardiovascular disease

Cardiovascular disease - Normal level of cholesterol and lipoprotein

Cardiac arrest and myocardial infraction - Signs, symptoms and risk factors

Management of heart disease - Diet, medicine and excersice

### UNIT IV (LECTURE HOURS: 18)

Renal Disease

Kidney stones - Diet and prevention

Food habits - food habits and preventive measures

COVID-19: Mitigating the Disease, management, and treatment

Infection disease.

Air Brone disease- TB

Water brone disease - Typhoid

### UNIT V (LECTURE HOURS: 18)

Health Insurance

Health Insurance - Individual mediclaim policy Domiciliary hospitalization - Procedures Cancer -  
Cancer insurance

Group mediclaim policy - Rules and regulations of family mediclaim policy

Text Books :

Practical clinical biochemistry

Varley, Harold; Gowenlock, Alan H; McMurray, Janet R; McLauchlan, Donald M; Varley,  
Harold. | Edition:-5 | - 2018

Reference Books :

Clinical chemistry-Principles and techniques | Edition:- 5| - | Michael L. Bishop -(2017)

Clinical laboratory diagnosis | Edition:-12 | - | Richard A. McPherson - (2019)

Course Title :INDUSTRIAL BIOCHEMISTRY (T)	CourseCode :
Semester : V	CourseGroup : SEC – G2 –B
Teaching Scheme in Hrs (L:T:P) : 4:0:0	Credits : 4 Credits
Map Code: C (THEORY - CONCEPTS)	Total Contact Hours :60
CIA : 25 Marks	SEE# : 75 Marks
Programme : B.SC., BC	# - Semester End Exam

No.	Course Outcome(Cos):	POs & PSOs	Cl. Ses	Blooms Taxonomy
CO1	Describe the microbial fermentation and its application in food industries	PO1 & PSO3	12	U
CO2	Elucidate the different methods of microbial culture preparation.	PO1 & PSO3	12	AP
CO3	Discuss the factors responsible for the fermentation process.	PO1 & PSO3	12	AP
CO4	Demonstrate the concept of food preservation and its technique.	PO1 & PSO3	12	U
CO5	Apply the techniques to isolate and purify the enzymes.	PO1 & PSO3	12	AP

## **UNIT I (Lecture Hours: 12)**

### **Introduction to Fermentation**

Technology: Isolation and Screening of Industrially Important Microbes, Various Methods of Isolation,; Inoculums Preparation; Detection of Microorganisms, Primary Screening, Secondary Screening, Biological Assay of Fermentation Products, Limitations of Bioassay, Diffusion Assay, Turbid metric Assay, Metabolic Response Assay, Enzymatic Assay; Advantages of Bioprocess Over Chemical Process

## **UNIT II:(Lecture Hours: 12)**

### **Fermentation Process and condition**

Batch Culture, List of Reagents and Instruments, Procedures; Fed-batch Fermentation, Fixed Volume Fed-batch, Variable Volume Fed-batch, Advantages and Disadvantages of Fed-batch Reactors, Fermenters; Microorganisms Used and Fermentation Process, Importance and Uses; Process of Fermentation; Control and Monitoring Fermentation System, Temperature, Gas Flow Rate, Liquid Flow Rate, Pressure measuring and Controlling Devices, Agitation Measuring

## **UNIT III:(Lecture Hours: 12)**

### **Tissue Culture**

Introduction to tissues culture, Plant Tissue Culture (Media composition,preparation, properties, uses and application) Animal Tissue Culture (Media composition,preparation,properties, uses and application)

## **UNIT IV :(Lecture Hours: 12)**

### **Techniques in Food preservation**

Bio Chemistry of Food Spoilage, Factors causing food spoilage during food ripening, vegetable maturation and their control. Post mortem changes in meat and their control. Food Preservation General principles of food preservation by use of high and low temperatures, drying, radiations, chemical preservatives, inert gases, mechanical preservation techniques QC, GMP and other topics General principles of Quality Control and Good Manufacturing Practices in food industry.Determination of shelf – life of food products, transport of perishable food items. Food Adulteration – Common food adulterants, their harmful effects and physical and chemical methods for their detection. Role of ISI Agmark and FDA in food industry.

## **UNIT V (Lectuer Hours: 12)**

Industrial Protein Enzymes,Isolation&Purification,Proteins& Enzymes – Source identification, isolation, recovery, concentration. Partial/total purification by salting in, salting out, precipitation, ion exchange, dialysis, ultra filtration, column chromatography (Gel filtration, Affinity, HPLC) Protein characterization, functional studies, evidence of purity, mass determination mass spectroscopy.

### Reference books

- R1. Peter stanbuy, Allan Whitaker, stephen j. Hall. Principles of Fermentation third Edition 2016.
- R2. Food Processing: Principles and Applications” by J Scott Smith and Y H Hui 2019. Second edition
- R3. Biotechnology of Microbial Enzymes: Production, Biocatalysis and IndustrialApplications 1st Edition, Kindle Edition by Goutam Brahmachari (Author), Arnold L Demain (Editor), Jose L Adrio (Editor) 2016

# SEMESTER VI

<b>Course Title</b>	<b>:DRUG BIOCHEMISTRY (T)</b>	<b>CourseCode :</b>
<b>Semester</b>	<b>: VI</b>	<b>CourseGroup: DSC - XI</b>
<b>Teaching Scheme in Hrs (L:T:P)</b>	<b>: 4:0:0</b>	<b>Credits : 4 Credits</b>
<b>Map Code: C (THEORY - CONCEPTS)</b>		<b>Total Contact Hours :60</b>
<b>CIA</b>	<b>: 25 Marks</b>	<b>SEE# : 75 Marks</b>
<b>Programme</b>	<b>: B.SC., BC</b>	<b># - Semester End Exam</b>

No.	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl. Ses	CL
CO1	Rephrase the basic concepts of pharmacology	PSO 1	12	U
CO2	Apply the principle of absorption, distribution, metabolism and excretion of drugs.	PSO 2	12	AP
CO3	Identify the mode of action of a drug, and the method by which it can be synthesized.	PSO 1	12	AP
CO4	Identify the causes of disease and effects of existing drugs and development of new modes of treatment	PSO 3	12	AP
CO5	Examine the mechanism of drug abuse	PSO3	12	AN

## UNIT I



## **THEORY**

### **DRUGS**

Introduction to drugs - The nature of drugs

Sources of drugs – Plants, Animals, Mineral / Earth sources, Synthetic / Semi-synthetic sources, Microbiological sources, Genetic engineering.

Routes of drug administration - Oral, Injections, Subcutaneous, Transmucosal

Cell surface receptors - Ion channels, G protein coupled receptors, Tyrosine kinases

Drug receptor interaction - Agonist, antagonist, Inverse agonist, partial agonist.

### **PRACTICAL**

**1. Study of different routes of drugs**

**2. Collection of blood samples**

### **UNIT II**

#### **THEORY**

Absorption - Passive Diffusion, Active transport, pinocytosis

Distribution - Plasma, Interstitial fluid compartment, transcellular fluid compartment, cellular fluid compartment

Metabolism – Phase I - Oxidation, reduction and hydrolysis Mixedfunction oxidases -

Epoxidation, hydroxylation, O,N and S-Dealkylation, N-Dealkylation

Phase II . - Sulphation, methylation, amino acid conjugation and glutathione conjugation

Elimination - Renal system - - Passive glomerular filtration and Active Tubular secretion.

#### **PRACTICAL**

**Free radical scavenging activity- 1. DPPH, 2. ABTS**

### **UNIT III**

#### **THEORY**

Chemotherapy-

Introduction - Definition and history

Antibacterial - Sulphonamides, Penicillin, Streptomycin, tetracycline.

Antimalarial - Quinine and chloroquine

Anti Tuberculosis - Isonicotinic acid hydrazide and Rifampicin.

Anticancer - Cyclophosphamide and methotrexate

#### **PRACTICAL**

**1. Gram staining and simple staining**

**2. Antimicrobial activity**

### **UNIT IV**

#### **THEORY**

#### **DRUGS ACTING ON VARIOUS DISEASE**

Central nervous system - Introduction, Structure and mode of action of barbiturates and salicylates.

Cardiovascular system - Introduction, Structure and mode of action of Cardiac glycosides

Hepatic diseases, Renal diseases

#### **PRACTICAL**

**1. Estimation of SGOT**

**2. Estimation of SGPT**

### 3. Estimation of Bilirubin (Kit Method)

#### UNIT V

#### THEORY

#### DRUGS OF PLANT ORIGIN

Primary and Secondary metabolites

#### DRUG DEPENDENCE AND ABUSE

Types - Psychic dependence and physical dependence

Factors which facilitate abuse - Availability of drugs, peer group pressure, socioculture.

Principles of Treatment - Hospitalization, drug therapy, substitution therapy.

#### PRACTICAL

1. Phyto chemical screening
2. Estimation of Phenols
3. Estimation of Flavonoids

#### Text Books:

1. Satoskar, R.S. and Bhandarkar, S.D. (2013).Pharmacology and Pharmacotherapeutics, Twenty third Edition, Vol. I and II, Popular Prakasam Pvt. Ltd, Mumbai.
2. William Foye (2012), 7th edition, Principles of medicinal chemistry.
3. Grahame, D.G.Smith and Aronson, J.K, Oxford Textbook of Clinical Pharmacology and Drug Therapy, 3 edition (2008)
4. Pharmaceutical Pharmacology by S C Metha and AshutoshKar, 2011, New age International publishers
5. Oxford Text book of Clinical Pharmacology and Drug Therapy, D.G Grahme Smith and K.Aronson.

#### Reference Books:

1. Tripathi, K.D. (2010).Essentials of Medical Pharmacology, Seventh Edition, Jay Pee Brothers Medical Publishers, New Delhi.
2. Mycek, M.J., Harvey, R.A. and Champe, P.C.(2010).Pharmacology, Fifth Edition, Lippincotts Illustrated reviews, Lippincott Williams & Wilkins publishers, North America.

<b>Semester</b>	<b>: VI</b>	<b>CourseGroup: DSC - XII</b>
<b>Teaching Scheme in Hrs (L:T:P)</b>	<b>: 4:0:0</b>	<b>Credits : 4 Credits</b>
<b>Map Code: C (THEORY - CONCEPTS)</b>		<b>Total Contact Hours :60</b>
<b>CIA</b>	<b>: 25 Marks</b>	<b>SEE# : 75 Marks</b>
<b>Programme</b>	<b>: B.SC., BC</b>	<b># - Semester End Exam</b>

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	BLOOM'S TAXONOMY LEVEL
CO1	Demonstrate the structure and mechanism of plant cell	PSO 1	12	U
CO2	Explain the photosynthesis and photosynthetic pigments and the reactions associated with it	PSO 1	12	U
CO3	Summarize the plant nutrition and cycle of elements	PSO 2	12	U
CO4	Inspect the growth hormones and biochemistry behind the ripening of fruits	PSO 3	12	AN
CO5	Examine the physiology of seed germination and plant tissue culture	PSO 3	12	AN

## UNIT I (LECTURE HOURS: 12)

### Plant cell

**Cell wall.** - structure and function of cell wall

**chloroplast** - Structure and function

**vacoules.** - Structure and function of vacoules.

**Absorption and translocation of water:** - Active absorption, Passive absorption

**Mechanisms - active and passive** - Active absorption of water -Osmotic absorption Non osmotic absorption. Passive absorption

**Ascent of sap: Mechanism and theories.** - Three theories

**Transpiration** - Water evaporation, Factors affecting Transpiration- Temperature Light, Available soil water wind

**mechanism of stomatal opening;** - Mechanism

**factors affecting transpiration** - Temperature Light Available soil water wind

**guttation.** - Watery solution oozes out from uninjured margin

### Activity

1 - Prepare chart for opening and closed stomata

2 - Prepare an animation model for cell structure

## UNIT II (LECTURE HOURS: 12)

### Photosynthesis

**Photosynthetic pigments: Photosynthetic apparatus- chlorophyll** - chlorophyll phycobillins carotenoid

**carotenoid and phycobillin;** - Yellow or orange pigment, Red and blue pigment

**Light reactions - two kinds of chemical system - photosystem-1** - Two phytochemical process 1 & 2 680mu

**Light absorbtion. and 2-evidences in support of light reaction.** - Two phytochemical process 1 & 2 700mu

**Hills reaction** - Absorption of light energy Activation of chlorophyll

**cyclic and non-cyclic phosphorylation** - Z - scheme Electron transport chain

**Dark reaction: Calvin's cycle (C3 plants),** - Carboxylation Reduction, formation

**Hatch-slack cycle (C4 plants)** - C4 dicarboxylation pathway

**Factors affecting photosynthesis.** - Internal, External factors

### Activity

1 - Download the animation for photosynthetic pigments and make a copy in CD

2 - Make a chart for carotenoids and phycobilin

## UNIT III (LECTURE HOURS: 12)

### Cycles of element

**nitrogen cycle** - Soil, Air, Plant

**ammonification, nitrification** - ammonification

**reduction and denitrification** - Introduction

**Nitrogen fixation:** - symbiotic and non-symbiotic nitrogen fixation. nitrate release of sulfur from organic compounds

**Sulfur cycle:** - oxidation of sulfur compounds; reduction of sulfate.

### Plant nutrition:

**Macronutrients** - Carbon, Hydrogen, oxygen, nitrogen, sulphur, phosphorus, calcium, potassium, magnesium and iron

**Micronutritients** - manganese, boron, copper, zinc, molybdenum and chlorine.

### Activty

- 1 - Prepare a PowerPoint presentation for nitrogen fixation
- 2 - Select a plant and identify the micronutrients present in it.

#### **UNIT IV (LECTURE HOURS: 12)**

**auxins:** - biosynthesis, mode of action And applications. Synthetic auxins.

**Gibberellins:** - biosynthesis and mechanism of action, applications

**Cytokinins** - mode of action and physiological role.

**Abscisic acid** - physiological role and mode of action.

**Ethylene:** - physiological role and mode of action.

**Biochemistry of fruit ripening** - Fruit ripening

#### **Activity**

- 1 - Collect the plants having the auxins level
- 2 - Prepare a chart for the mechanism of fruit ripening

#### **UNIT V (LECTURE HOURS: 12)**

##### **Plant Tissue culture**

**Biochemistry of seed germination.** - Physiology of seed germination

**Totipotency** -

**Media** - MS media : composition and preparation

**Callus culture** - Undifferentiated masses of cells

**Micropropagation** - Applications.

**Biochemical changes during senescence.** - Introduction

**Protoplast fusion** - Polyethylene glycol

#### **Activity**

- 1 - Make a chart for preparation of agar medium
- 2 - Collect the procedure for callus culturing

#### **Text Books :**

Fundamentals of plant physiology | Edition:11th edition | S.Chand & Company Ltd | V.K.Jain(2004)

#### **Reference Books :**

Plant biochemistry and molecular biology | Edition:1 | ohm wiley and sons | Lea AND Leawood(2000)

2015-2016 Batch