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

0422-2687421/603

BIOCHEMISTRY (UG)

SCHEME OF EXAMINATION AND SYLLABUS

2022-2025

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. SrividyalakshmiSenthil Ganesh

SECRETARY

Prof. Saramma Samuel

PRINCIPAL

Dr. T. Sivakumar

VICE PRINCIPAL

Dr. M.P. Ayyappadas

CONTROLLER OF EXAMIATIONS

Ms. G. Jeyalakshmi

HEAD OF THE DEPARTMENT

Dr. S.Shamina

PROGRAMME OUTCOMES (POs):

PO1	Graduates can have strong fundamentals in their specific discipline along with DIGITAL STRATEGIC knowledge.
PO2	To increase student's ability to communicate effectively with the community /society in verbal /written courage for such as to give or receive clear instruction.
PO3	To enhance their ability to understand and identify the professional and ethical responsibilities.
PO4	To enrich their personality and character development

PROGRAMME SPECIFIC OUTCOMES: (PSOs)

Upon completion of Bachelor of BIOCHEMISTRYDegree, STUDENTS are able to achieve the following outcomes.

PSO1	To understand the fundamental concepts and master the pertinent experimental and theoretical techniques in Molecular Gene expression, Proteomics, Pathology, Clinical research and Nano-sciences so as to inflate the understanding of biology.
PSO2	To transform the way by using sophisticated technologies and thereby gaining insights from clinical data to make cognizant decisions, predictions and to reveal the proficiency in quantitative reasoning and analytical skill within a student.
PSO3	To understand the research oriented learning that develops methodical and integrative problem-solving approaches in the biochemical industries by enabling them to write effective project reports in multidisciplinary environment.
PSO4	To augment the students in pre-clinical studies and cancer biology enabling them to invent new ideas to develop their entrepreneurial skills, decisive thinking and self-governance.

GRADUATE ATTRIBUTES

- DISCIPLINE KNOWLEDGE
- PROBLEM ANALYSIS
- CRITICAL THINKING
- MODERN TOOLS USAGE
- SOFT SKILLS
- SELF LEARNING
- LIFE LONG LEARNING
- INDIVIDUAL & TEAMWORK

RATHNAVEL SUBRAMANIAM COLLEGE OF ARTS & SCIENCE (Autonomous)

Sulur, Coimbatore – 641 402

SCHEME OF EXAMINATIONS-

B.Sc BIOCHEMISTRY 2022 – 2025 BATCH

mester	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
I	MIL - I	Tamil-I/Hindi-I / Malayalam – I/ French-I/Arabic- I	3	4	-	-	25	75	100	3
	AECC – G I -1	English-I	3	4	-	-	25	75	100	3
	DSC – I	Biomolecules	3 3	4	-	4	25 40	75 60	100	6
	DSC – II	**Cell Biology & Microbiology**	3 3	4	-	4	25 40	75 60	100	6
	NCC – GII	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
	LIB	Library	-	1	-	-	-	-	-	-
	Total				**26**				**400**	**18**
II	MIL-II	Tamil-II/Hindi-II/Malayalam – II/French-II/Arabic-II	3	4	-	-	25	75	100	3
	AECC – GI -2	English-II	3	4	-	-	25	75	100	3
	DSC – III	**Human Physiology and Endocrinology**	3 6	4	-	4	25 40	75 60	100	6
	DSC – IV	Bioinstrumentation Techniques	3 6	4	-	4	25 40	75 60	100	6
	AECC – G II - 1	Environmental Studies	3	1	-	-	100	-	100	1
	NCC – G II	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
	LIB	Library	-	1	-	-	-	-	-	-
	Total				**27**				**500**	**19**

Semester	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
III	**MIL-III**	**Tamil-III/Hindi-III/Malayalam – III/French-III/Arabic-III**	**3**	**4**	**-**	**-**	**25**	**75**	**100**	**2**
	AECC- GI-3	**English-III**	**3**	**4**	**-**	**-**	**25**	**75**	**100**	**2**

	DSC – V	Enzymology	3 6	4	-	4	25 40	75 60	100	6
	DSC – VI	**Bioenergetics & Metabolism**	3 6	4	-	4	25 40	75 60	100	6
	DSE - I	Elective - I	3	5	1	-	25	75	100	6
	NCC – G I -1	Professional English - I	3	2	-	-	Grade			
	NCC – G II	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
	Total				**33**				**500**	**22**
IV	**MIL-IV**	**Tamil-IV/Hindi-IV/Malayalam – IV/French-IV/Arabic-IV**	**3**	**4**	**-**	**-**	**25**	**75**	**100**	**2**
	AECC- GI-4	**English-IV**	**3**	**4**	**-**	**-**	**25**	**75**	**100**	**2**
	DSC – VII	Clinical Biochemistry& Clinical Lab Technology	3 6	4	-	4	25 40	75 60	100	6
	DSC – VIII	Molecular Biology	3 6	4	-	4	25 40	75 60	100	6
	DSE - II	Elective - II	3	5	**1**	-	25	75	100	6
	NCC – G I - 2	Professional English - II	3	2	-	-	Grade			
	AECC – G II - 2	Aptitude	3	3			100	-	100	3
	NCC – G II	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
	Total				**36**				**600**	**25**

Semester	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
V	DSC – IX	Genetic Engineering	3 6	4	-	4	25 40	75 60	100	6
		Immunology	3	4	-	4	25	75	100	6

	DSC – X		6				40	60		
	DSE-III	Elective-III	3	5	1	-	25	75	100	6
	DSE –IV	Elective - IV (EDC)	3	5	1	-	25	75	100	6
	Any ONE Group									
	Group A									
	SEC – G I – A – 1	Placement - College to Corporate I	3	2	-	-	50	-	50	2
	SEC – GI – A – 2	Placement - College to Corporate II		2	-	-	50	-	50	2
	Group B									
	SEC – G I – B	Industrial Biochemistry	3	4	-	-	100	-	100	4
	NCC – G II	NCC/NSS/SPORTS/CULTURALS	-	1	-	-	Good/ Satisfactory			
	Total				**36**				**500**	**28**
VI	DSC – XI	**Drug Biochemistry**	3 6	4	-	4	25 40	75 60	100	6
	DSC – XII	**Plant Biochemistry**	3 6	4	-	4	25 40	75 60	100	6
	DSE- V	DSE: Elective-IV	3	5	1	-	25	75	100	6
	DSE – VI	Project Work & Vivo Voce	3	6	-	-	40	60	100	6
	ALCTA * (e-Learning in MOOC Platform)				Extra Credits					4*
					32				**400**	**24**
TOTAL									**2900**	**140 +4 * =144**

GUIDELINES TO BE FOLLOWED FOR SCHEME OF EXAMINATIONS

2022 -2023 BATCH

1. I & II Semester - No changes in the scheme / syllabus.
2. III & IV Semester – Incorporate Language III & IV and English III & IV in the respective semester. Allocate 4 Lecture hours and 2 credits for each.
3. Communicative Skills I & II – Remove from III & IV semester.
4. If necessary, modify the 4 + 4 course into 5 + 1 pattern to adjust the teaching hours per week to a maximum of

36 hours.

5. After modification, total marks and credits for All UG programs – 2900 Marks and 140 credits + 4 extra credits for ALCTA.
6. There is no change in mark distribution (CIA + EOS) for Theory and Practical.
7. **Language III & IV / English III & IV / Total Marks/ Total Credits** – Should be the same as mentioned in the format.
8. Common courses for All UG Programs– Make the changes in the **course opted** column as mentioned in the format.

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. Health Management

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. @@@@@@@@@

NOTE: DSE – I, II & III - Semester may be varied as per the requirement of the department.

DISCIPLINESPECIFICELECTIVECOURSES(DSE)IV:(V-SEMESTER)								
DSE–IV-EXTRADISCIPLINARY COURSE:(EDC)								
Course	**CourseName**	**L**	**T**	**P**	**CIA**	**ESE**	**Total**	**Credits**
OneCourse–FromtheGroup								
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
Total							**100**	**6**

SEMESTER-I

SEMESTER - I

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

SEMESTER - I

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

No.	**Course Outcomes (Cos): After completion of this course, the students will be able to**	**POs**	**CL. Ses**	**CL**
CO1	□□□□□□□□□ □□□□□□□□□□□ □□□□□□ □□□□□□□□□□□□□□ □□□ □□□□□ □□□□□□□□□ □□□□□□□□□□□□□□□□□□□□□□□ □□□□□□□□□□□□□□□□□ □□□□□□.	PO4	14	U
CO2	□□□□□□ □□□□□□□□□□□ □□□□□□□□□□□□□□□ □□□□□ □□□□, □□□□□□□, □□□ □□□□□□□□□□□ □□□□□□, □□□□□□□, □□□□□□□□□ □□□□□□□□□□□□, □□□□□□□□□ □□□□□□□ □□□□□ □□□□□□□□□ □□□□□□□□□□ □□□□□□□□□□□□□	PO7	15	**U**
CO3	□□□□□□□□□□□□□□ □□□□□□□ □□□□□□□□□□□ □□□□□□□□□□□□ □□□□□□□□□□□□□□□ □□□□□□□□ □□□□□□□□ □□□□□□□□□□□□, □□□□□□ □□□□, □□□□□□□□□□□□□□ □□□□ □□□□ □□□□□□□□□□ □□□□□□□□□□□□□.	PO8	12	U
CO4	□□□□□□□□□□ □□□□□□□□□□□□□□□□ □□□□□□□□□ □□□□□□□□□ □□□□□□□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□□ □□□□□□□□□ □□□□□□ □□□□□□□□□□ □□□□□□□□ □□□□□□□□□□□	PO2	9	**AP**
CO5	□□□□□□□ □□□□□□□□ □□□□□□□ □□□□□ □□□□□□□□□□□□□□□□□ □□□□□□□□□□□□□□.	PO1	10	AP

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Semester	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 :**HINDI – I (T)**	Course Code : 11H
Semester : **I**	Course Group : **MIL - I**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : 3
Map Code: A (Language- Concepts)	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **I YEARALL 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	CS	C L
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

Jeevanki 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.)

haarkijeet :(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).

Gauragai :(mahadevivarma's introduction. She was touching her memory lane through gauragai. 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. Vetnary doctor examined the cow and they told that there isa needle in the stomach, if it reached to heart gaura will die. Mahadevi enquired about this and the matter was the gwala 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 : IIIGADHYA AUR KAHANIYAN LECTURE HOURS:12

Chaiwaala: (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 theshopkeeper though he is a poor, he doesn't want to have the money which is not right to have that. Conclusion).

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

Shivajikasacchaswarup: (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 defeting 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: (Shabdhvichar: basic grammer knowledge will help the students to improve the language skills withsangya, sarvanaam, kriya, karak, visheshan, with sub topics).

UNIT : V TRANSLATION. LECTURE HOURS: 9

Hindi to EnglishTranslation. (Teaching about the importance and art of translation)

Text Books:

1. PUSHP KUNJ COMPILED BY BOS HINDI.

REFERRENCE:

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

Semester	Course Opted	Course Name	D	L	T	P	CIA	ESE	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 : **3Credits**
Map Code: **A (Language Concept)**	Total Contact Hour : 60
CIA : **25 Marks**	SEE : **75 Marks**
Programme: I Yr**ALL UG PROGRAMMES** # - **Semester EndExam**	

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 **LECTURE HOURS: 12 ENMAKAJE – AMBIKA SUDHAN MAANGHAD**

(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 **LECTURE HOURS: 12 ENMAKAJE – AMBIKA SUDHAN MAANGHAD**

(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 nedia attention. Jayarajan , social worker who took the matter and fought with the Government for the tolal 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 foe 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 - AmbikaasuthanMangad

T2. ShishyanumMakanum - Vallathole Narayana menon

REFERENCE TEXTS:

R1.MalayalanovalSahithyacharithram – KM Tharakan N B S Kottayam - 2000

R2. Malayalakavithasahithyacharithram | Edition: 2 | D C Books | LeelavathiM-2001

R3.Saahithyacharithra Prasthaananghaliloode – Dr. KM George, D C Books, Kottayam - 2004

m es te	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
I	MIL-I	French-I	3	4	-	-	25	75	100	3

Course Title : **FRENCH-I (T)**	Course Code : **11 F**
Semester : **I**	Course Group : **MIL-I**
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 : **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	Decouverte du francais, Premiers contacts, La langue de la classe. Demander de se presenter & se presenter, Demander/Donner des informationspersonnelles.	PO2	20	R
CO2	Demander/Dire le lieu d'habitation, Exprimerses gouts, Parler de safamille.	PO2	10	U
CO3	Faire des courses alimentaires, Donner une appreciation, Commander au restaurant.	PO4	10	AP
CO4	Presenter uneville/un quartier, Se deplaceren transports encommun, Demander/Indiquer le chemin.	PO4	10	AN
CO5	S'habiller, Donner uneapprecitation, Parler de la meteo, Decrire un objet.	PO7	10	C

UNIT – 1: Bienvenue & Je suis… - (Lecture Hours: 20 Hrs)
Les Informationsinitiales- (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-cequ'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'estou ? - (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'esttendance ! - (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 | SergueiOpatski | ViolettePetitmengin | Sylvie Pons | Hamza Djimli (DELF) | Julie Veldeman-Abry (Phonetique) | (January, 2022)

Reference Books:

R1. Larousse – Dictionnairebilingue | 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 ii) verb2verbe.com iii) tolearnfrench.com

CourseTitle : English I **(T)**	Course Code :
Semester : I	Course Group : ELN I
TeachingschemeinHrs. (L: T:P): 4:0:0	Credits : 3
MapCode :A (Language concept)	TotalContactHours: 60

CIA	:**25Marks**	SEE	: **75Marks**
Programme	:**All I UG Courses**		**#-SemesterEndExam**

No.	**CourseOutcomes(Cos): Aftercompletion ofthiscourse,thestudentswillbeableto**	**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 - IIILECTURE 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 - IVLECTURE 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 - VLECTURE HOURS:12
Stopping by Woods on a Snowy Evening – Robert Frost: Thestory 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 : **BIOMOLECULES**	CourseCode :13A
Semester : **I**	CourseGroup :**DSC-I**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4Credits**
Map Code : **C(THEORY CONCEPTS)**	TotalContactHours 60
CIA : **25 Marks**	SEE : **75Marks**
Programme: **BSC-BC**	

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 itsstructure)

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 aminoacids (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:5W.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 | Mac millan Worth Publishers USA | DAVID.L NELSON ANDMICHAEL.M.COX(20

List of Experiments:

1. Qualitative Analysis of Monosaccharides- Glucose andFructose
2. Qualitative Analysis of Disaccharides - Sucrose andMaltose
3. Qualitative Analysis of Polysaccharides - Starch andDextrin
4. Determination of Acid number of edibleoil.
5. Determination of saponification number of edibleoil
6. Estimation of unsaturated fat by iodine value ofoil.
7. Qualitative Analysis of Non-polar, Aliphatic Aminoacids- Methionine,Leucine
8. Qualitative Analysis of Aromatic Aminoacids- Tyrosine,Tryptophan

Course Title : **BIOMOLECULES (P)**	CourseCode :13P
Semester : **I**	CourseGroup :**DSC-I**
Teaching Scheme in Hrs (L:T:P) :**0:0:4**	Credits **4**
Map Code : **H(PRACTICAL EXPERIMENTS)**	TotalContactHours 60
CIA : **25 Marks**	SEE : **75Marks**
Programme: **BSC-BC**	

9. Qualitative Analysis of Polar, Uncharged Aminoacid-Serine
10. Qualitative Analysis of Charged Aminoacid- Histidine
11. Identification of protein by Biuretmethod
12. Denaturation of protein usingEgg
13. Isolation of protein from different organicsources
14. Quantify the amount of casein present in milksamples
15. Isolation & Purification ofDNA

Course Title : **Cell Biology and Microbiology**	CourseCode :13B
Semester : **I**	CourseGroup :**DSC-II**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4Credits**
Map Code : **C(THEORY CONCEPTS)**	TotalContactHours 60
CIA : **25 Marks**	SEE : **75Marks**
Programme: **BSC-BC**	

ourse outcome: (Cos)

UNIT - 1

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 pagocytosis	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 and new microbes under isolation .	PSO3	6	Ap

(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, Ciliospora. 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 anetIwasa, 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 : **Cell Biology and Microbiology (P)**	Course Code : 13Q
Semester : **I**	Course Group : **DSC-II**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits **4**
Map Code : H (PRACTICAL - EXPERIMENTS)	Total Contact Hours **60**
CIA : **25 Marks**	SEE : **75 Marks**
Programme: **BSC-BC**	

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

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

Course Title :**TAMIL - II (T)**	Course Code : 21T
Semester : **II**	Course Group : **MIL- II**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : 3
Map Code: A (Language- Concepts)	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **ALL I YEAR UG PROGRAMMES**	**Semester End Exam**

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

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

SEMESTER-II

Course Title :**HINDI – II (T)**	Course Code : 21H
Semester : **II**	Course Group : MIL - II
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : 3
Map Code: A (Language- Concepts)	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # : **75 Marks**

Programme: **ALL I YEARUG PROGRAMMES** **Semester End Exam**

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: (samajkepratikabirkivani , samaj me sadhuvonkeprati kalian kibhavana, jyadalalachkibhavana se durrehnekimaangishwar se kartehaia, jitnimehnat hum karengeutna hi phalpavengeuskesiddhantkoyuvyaktkartehai, ninakonkopaasrakhnekisalaahdetehai, unkivajah se hum nirmal ho jayengebinasabuntathapaanike, manushyonkijindagibahutkumsamaykeliey, I hai, usme hum acchekarmon se duniyakapremjitnahai, atmaparamatmake Milan kibaatkartehai, jaisejal me kumbkumb me jalkebarabaratmaparamatmeketatvahai jo acchekarmokivajah se paramatka me vilin ho saktehai).

RAHIM KE DOHE (rahimkeanusaarprembahutpunithai, issebachakarrakhnachahiey, rahimkeanusaarmadhurbaarbolnichahieykhari baton se dildukhna to durvemitratakelieylayaknahi ban jaate, taruvarjistarike se apnaphalkhudnahikhatausitarah bade log sampattikoikkatakarkedusaronkemadadkelieydetehai to usme koi kharabinahihai, panikamahatvakobatatehaijisemanav me manyshyarupimanavaatakijarurathai).

UNIT – II (LECTURE HOURS: 15)

CHARU CHANDRA KI CHANCHAL KIRANE:

(Maithili charanguptkepanchavatikavya se liyagayapdyahai. Ismeprakrutivarnankaadhikstaandiyagayahai. Chandiraatkavarnan, nadi ka varnan,ityadi,2. Panchavatikichaya me parnakutirhaijiskesammukhlakshmanpahredari banker baithahuahai, kisivrat me leen yah nidrakokhote hue vipinkoapnavaasbanahuahaiyise is kutiya me kyadhanhai. Mritymalokkipaponkomitane swami sang jo aayihaivah teen lokkilakshmihai, uskekhatir ye lakshmanpehredaribanahuahai.)

VAH TODTI PATHAR:

(niraladwarakrutekdiyakavitahaijismedopherkesamay me bin cchayadhup me baithkarpathartodrahihaiuskavarnanhai.)

KYA PUJAN KYA ARCHAN RE:

(mahadevivarmadwarakrutkavita me ye deh hi devalaykebarabarhai, jiskojis par nivasishwarkaehsaa ho to manyshyjindagikasaakarmilega. Isi tatvkolekarvarmacchayavaaditatvakodarshate hue is kavitakorachihain.

JO BEET GAYI SO BAAT GAYI)

(bacchanji ne is kavitakedauraan ye darshaatehaiki jo baat beet chukihaiuske bare me chintakarnesekya lab? Aagekiagrasarhonapadega. Isi tatyako is kavitadarshatihai).

UNIT III (LECTURE HOURS: 15)

DAUD LAGHU UPANYAAS: (mamtakaliadwaralikhitlaaghuupanyaasek Madhya vargiyaparivaarkikahanikodarshatahai. Ismepavanapnemaabaap se durnaukrikelieyilahabad se ahmedabaad aa jaatahaiaurpuranevicharonketyajnayevicharon se phalibut ho jaatahai. Islieymaabaapauruske beech kiduriyan bad jaatihai. Aurchotimotibaateaapas me uthirehtihai. Vah ekladkikopasandkartahaiuskomaapasandnahikarti, magaruskiparavasahuskonahivahaagebadkarsamuhikvivahkarlewtahai. Aajkalkipidimaabaap se badkarpaisekamahatvdetehai. Akhirchota beta bhivideshchalejaatahai, lautkarnahiaanekisambhavananahihai. Maa bap kavilap bad to jaatahaimagarlautanahi)

UNIT IV (LECTURE HOURS: 8)

VYAKARAN:(vachanaur ling ka bed , striling se pulling me badaln, ekvachan se bahuvachan me baldnekapuravivarantathaniyamkodena)

UNIT IV (LECTURE HOURS: 7)

Anuvaadabhyaas

(Angreji se hindi me parivartankarnachoteshabdonkaanuvadkarnathathavakyonkaanuvaadsaath hi panktiyonkaanuvaadkarnaaadiabhyaaskochotronkodena)

Text Books:

1. VIVIDH MAALA: COMPILED BY BOS HINDI.

REFERRENCE:

1. MANAK HINDI VYAKARAN. VANI PRAKHASHAN, N.DELHI.
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwj0tq7U4pyAAxUL4TgGHWsfBSgQFnoECBMQAQ&url=https%3A%2F%2Fwww.hindi-kavita.com%2FHindiPanchvatiMaithilisharanGupt.php&usg=AOvVaw33u82y1QBzUZw0cMQr-4x0&opi=89978449https://www.youtube.com/watch?v=sh68KY1X2RA

Course Title : MALAYALAM – II(T)	Course Code : 12 M
Semester : **II**	Course Group : **MIL - II**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **3Credits**
Map Code: **A (Language Concept)**	Total Contact Hour : 60
CIA : **25 Marks**	SEE : **75 Marks**

Programme : **I Yr ALL UG PROGRAMMES# - Semester EndExam**

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 NIILAKANDA 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 NIILAAMBARI - 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 EACHIKKAANAM

(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 AramanteKodathi*, *Yathrakkidayil* and *NjangalNjangalAsuranmar* 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*, *NjangalAsuranmar* and *M. P. Narayana PilayudeKathakal*. He wrote only one novel, *Parinamam*, which was selected for the Kerala SahityaAkademi Award for Novel)

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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 SarggaSangeetham.[Between 1950 and 1961, he published a number of anthologies including *KonthayumPoonoolum* (1950), *NaadinteNadam*, *EnikkuMaramamilla*, *Mulankadu* (1955), *OruJudasJanikk unnu* (1955), *Enteattolikavithakal* (1957), and *Sargasangeetham* (1961), a khandakavyam titled *Ayisha*, two short story anthologies,)

UNIT - IV TRAVALOGUE LECTURE HOURS: 12

PURUSHANTHARANGALILOODE – VAYALAR RAMAVARMMA

(VayalarRamavarma 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 *AchanumBappayum*, which include "*ManushyanMathangaleSrishtichu*". He was also a famous poet, best known for his poems – *Sargasangeetham*, *Mulankaadu*, *Padamudrakal*, *KonthayumPoonoolum*, *EnikkMaranamilla*, *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 BhashaSankethikaVidyayumComputerum, Malayalm Computing, Internetile Malayalam, E. Malayalam)

TEXT BOOKS:

T1. UthuppaanteyKinar - Ediiton – 2, DC Books – 1990 - KaroorNiilakantappillai

T2. Poovambhazham – Edition – 3, DC Books – 2003 - Vaikkam Muhammad Basheer

T3. ShabdikkunnaKalappa – Edition – 3, 2000, Current Books, PonkunnamVarkki

T4. NashttappettaNeelambari – 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, VayalaarRamavarmma

T8. E- Malayalam – Edition – 3, Kerala Bashainstitute 2019, Sunitha TV

REFERENCES:

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

WEB RESOURCES

https://youtu.be/hOgGteIBC_Mhttps://youtu.be/QDj7RApGg6k
https://youtu.be/M8DNtoB0kTA https://youtu.be/rJ1UEyI65qk
https://youtu.be/-MqXQnpTJ3khttps://youtu.be/jMi-1OwSlB4
https://youtu.be/GE-wyIB0OtAhttps://youtu.be/QVId_t6DT_M
https://youtu.be/WNEye7uOymshttps://youtu.be/UCn3hfj8Apo
https://youtu.be/amobVw5Bvko **https://youtu.be/vSTZVrSx_Xw**

Semester	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 : **FRENCH-II (T)**	Course Code : **21 F**
Semester : **II**	Course Group : **MIL-II**
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 : **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 sesactivitesquotidiennes,Demander/Dire l'heure,Proposer/Accepter/Refuser une sortie, Decrireunepersonne.	PO2	12	R
CO2	S'informer sur un logement, exprimer des regles de vie commune, Expliquer un problemedomestique.	PO2	12	U
CO3	Exprimerune emotion, Parler de sa santé et de sport, Exprimer son accord ou son desaccord, Exprimerune obligation, une interdiction, Donner un conseil.	PO4	12	AP
CO4	Reserverunechambred'hotel, Decrireuneville, un pays, Decrire un paysage, Exprimer la preference, Ecrireune carte postale.	PO4	12	AN
CO5	Parler de ses etudes et de son universite, Parler de ses competences, Parler de son projetprofessionnel, Parler de son métier.	PO7	12	C

UNIT – 1: Qu'est-cequ'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: Enforme - (Lecture Hours: 12 Hrs)
Communication - (Translation & Comprehension Passages)
Grammaire - (Grammar Exercises)
Vocabulaire - (Vocabulary Exercises)
Culture & Francophonie - (Information about French Culture & Francophone Countries)

UNIT – 4: Bonnesvacances ! - (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 | SerguieOpatski | ViolettePetitmengin | Sylvie Pons | Hamza Djimli (DELF) | Julie Veldeman-Abry (Phonetique) | (January, 2022)

Reference Books:
R1. Larousse – Dictionnairebilingue | 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 ii) verb2verbe.com iii) tolearnfrench.com

Course Title	: **ENGLISH – II (T)**	Course Code	: **22E**
Semester:	II	Course Group	: ELN-II
Teaching scheme in Hrs (L:T:P) : 4:0:0		Credits	: 3
Map Code	:A	Total Contact Hours:	60
CIA	:**25Marks**	SEE	: **75Marks**
Programme	All UG Programmes		**#-SemesterEndExam**

COs.	Course Outcome (COs): After successful completion of this course, the students will be able to	PSOs	Cl. Ses	CL
CO1	Enrich the students with pronunciation and accuracy in the use of English Language.	PSO1 and PSO4	12	R
CO2	Aid them understand the responsibilities and societal problems and solutions along with one act plays.	PSO1 and PSO4	12	R
CO3	Teach them various opportunities and success of different noble people.	PSO1 and PSO4	12	U
CO4	Help the students to learn the variety of sentence structures.	PSO1 and PSO4	12	U
CO5	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 Gales worthy – 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. D**r. APJ Abdul Kalam : AvulPakirJainulabdeen 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 Tuscumbia, 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 : **Human Physiology and Endocrinology**	Course Code : 23A
Semester : **II**	Course Group : **DSC - III**
Teaching Scheme in Hrs (L:T) : **4:0:4**	Credits :4
Map Code: C(THEORY)	Total Contact Hours: 48
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **BSC-BC**	**# - Semester End Exam**

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)

No	Course Outcome (Cos): After completion of this course, the students will be able to	Pos &PSOs	Cl.Ses	BLOOM'S TAXONOMY LEVEL
CO1	Describe the structure and functions of human anatomy digestive system	PO1& PS01	10	U
CO2	Describe the composition and functions of human body fluids	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 brain structure and function	PO1& PS01	10	R
CO5	Describe the structure, functions of kidney and renal function and micturition.	PO1& PS01	8	U

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 O2 and CO2
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 filteration
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. Mechanisim 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)

Semester : **II**	Course Group : **DSC - XI**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits :2
Map Code: C(THEORY)	Total Contact Hours: 60
CIA: **40 Marks**	SEE # : **60 Marks**
Programme: **BSC-BC**	# - **Semester End Exam**

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

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

No.	Course Outcome	PSOs	Cl. Ses	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

(LECTURE HOURS: 12)

Chromatography: (Definition and its types), Paper Chromatography- (Principle, Technique & applications),ThinLayer 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),Flourimetry- (Principle, Instrumentation and applications)

UNIT – V

(LECTURE HOURS: 12)

ISOTOPES AND RADIOACTIVITY – Introduction- (Tracer techniques),Radioactive decay and units of radio activity-(Curie, Bequerel, 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	:**BIOINSTRUMENTATION TECHNIQUES (P)**	Course Code	: 23Q
Semester	: **II**	Course Group	: **DSC-IV**

Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits : **2**
Map Code :H (PRACTICAL - EXPERIMENTS)	Total Contact Hours: **60**
CIA : **40 Marks**	SEE : **60 Marks**
Programme: **BSC-BC**	

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

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

Course Title : **TAMIL III (T)**	Course Code : 31T
Semester : **III**	Course Group : **MIL - III**

Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : 3
Map Code: A (Language- Concepts)	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **ALL II YEAR UG PROGRAMMES**	**Semester End Exam**

No.	Course Outcomes (Cos): After completion of this course, the students will be able to	POs	CL. Ses	CL
CO1	□□□□□□□□□□□□□□□□□□□□□□ □□□ □□□□□□□□□ □□□□□□□□□□□ □□□□□□□	PO7	14	U
CO2	□□□□□□□□□□□□ □□□□□□□□□□□□□□□□□□□□□□□□ □□□□□□□□□□□□ □□□□□□□□□□□ □□□□□□□□□□□ □□□□□□□	PO7	14	U
CO3	□□□□□□□□□□□□□□□□□□□□ □□□ □□□□□□□□□□□□□□□□□□□□ □□□□□□□□□ □□□□□□□□□□□ □□□□□□□ □□□□□□□	PO3	12	R
CO4	□□□□□ □□□□□□□□□ □□□□□□□□□□□□□□□□□□□□□□□□□□□□ □□□□□□□□□□□□□□□, □□□□□□□□□□□□ □□□□□□□□□□□□□ □□□□□□□	PO2	10	AP
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Semester	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 :**HINDI-III (T)**	Course Code : 23H
Semester : **III**	Course Group : **MIL - III**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : 3
Map Code: A (Language- Concepts)	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **ALL II YEAR UG PROGRAMMESS**	**semester End Exam**

No	**Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes.**	**POs**	**CS**	**C L**
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

UNIT I **LECTURE HOURS:12**

NijiPatraLekhan:(private letters, letter to father, letter to mother, letter to friend, letter to other relations is comes under nijipatra ,pitajimatajikenaampatraMitra, 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 patralekhan, Paribhashikshabdavali – Padnamvamantralayokenaam)

UNIT IV **LECTURE HOURS:12**

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

UNIT V **LECTURE HOURS: 12**

PratiyogiPariksha :(ispar adharitPatrachar se SambandhitPrashikshanKarya,Praroop banana kaPrashikshandena, TippanlikhnekPrashikshan Dena, Vibhinnapratiyogiparikshaoke 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

Semester	Course Opted	Course Name	D	L	T	P	CIA	ESE	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 : **III**	Course Group : **MIL - III**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **3Credits**
Map Code :**A (Language Concept)**	Total Contact Hour : 60
CIA : **25 Marks**	SEE : **75 Marks**
Programme : **II Yr ALL UG PROGRAMMES# - Semester EndExam**	

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 deathThe 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 strive hard to survive but happily and peacefully leading a pleasant life with his family.Pavan,avagabound 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.Malayalanadakasahithyacharithram – G Shankkarappilla – DC Books

R2. Malayalanadakam – DrEzhumatturRajarajavarmma DC Books

RR3. Kairaliyude Katha – N Krishnapilla - DC Books\

4. MalayalasahithyamKalaghattangailoode – Erumeli Parameswaran Nair – DC Books

R5. ThirakkathaaSahithyam – Jose K Manual – DC Books

Semester	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 : **FRENCH-III (T)**	Course Code : **31F**
Semester : **III**	Course Group : **MIL-III**
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 : **ALL II 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 son parcours, Exprimer son intention de faire quelque chose, Parler de ses gouts, 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, Exprimersa 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, Decrirel'utilite d'un objet, Exprimersa 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: Touspareils, 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 | ViolettePetitmengin| Marlene Dodin (DELF) | Julie Veldeman-Abry (Phonetique) | (April, 2022)

Reference Books:
R1. Larousse – Dictionnairebilingue | 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 ii) verb2verbe.com iii) 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 :6**0**	
CIA :**25Marks**		SEE : **75Marks**	

Programme	:**All II UG Courses**	**#-SemesterEndExam**

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 – OodgerooNoonuccal- 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.

CourseTitle :**ENZYMOLOGY**	Course Code :43B
Semester :**III**	CourseGroup :**DSC-V**
TeachingSchemeinHrs(L:T:P):**4:0:0**	Credits :**6**
MapCode :**C(THEORY CONCEPTS)**	TotalContactHours:**60**
CIA :**25Marks**	SEE :**75Marks**
Programme:**BSC-BC-BIOCHEMISTRY**	

Courseoutcome:(Cos)

No.	CourseOutcome(Cos):Aftercompletion ofthiscourse,the students willbe able to	POs&PSOs	Cl.Ses	CL
CO1	DescribetheNomenclatureandClassificationofenzymesaccordingtoInternationalUnionofBiochemistry(IUB) and Explain the salient features and models of active sites of enzymes.	PSO 1	12	U
CO2	Distinguish theenzymekineticsand different types of enzymeinhibition ienzymecatalytic reaction.	PSO2	12	An

CO3	Categorizethe structure and functions of different Coenzymesand the roleofcoenzymesinvarious metabolicreaction.	PSO 2	12	An
CO4	Construct the methods of Enzyme Immobilizationsand its applicationsinvariousIndustrialaspects.	PSO 3	12	Ap
CO5	Identify the varioustypes of enzyme biosensor andits applicationin different clinicalaspects.	PSO3 & PSO4	12	Ap

UNIT-I : ENZYME:INTRODUCTIONANDCLASSIFICATION:

Enzyme: Introduction – (Properties and History) & Nomenclature - According to IUB system. Digit number,Suffix "ase" Classification - Six main classes, (Definition & suitable examples) Active site-(Introduction &Modeofaction)-Salientfeaturesofactivesiteresidues.Binding sitesand catalyticsites. Lock and Keymodel

– (Definition,mechanism & diagrammatic presentation)Induced fitmodel – (Definition,mechanism &diagrammaticpresentation)

UNIT-II : ENZYMEKINETICS:

Steady state theory – (Introduction, Rate of formation of ES, Graph) Michaelis-Menton equation, Km - Michaelis constant.- (Introduction and Derivation.) LB Plot - LB Plot Graph. Hanes plot - Based on the MMequation. (Introduction & Derivation) Enzyme inhibition & factors affecting enzyme activity – (IntroductionandMechanism)Reversibleinhibitors,Irreversibleinhibitors.Competitive,Non-competitive&Uncompetitiveinhibition – (Mechanism with examples) Effect of various factors affecting enzyme activity - Vital role inmetabolic regulation. (Substrate, enzyme, temperature & PH, Saturation point, Vmax, Km, Optimum PH &Temperature)

UNIT-III : COENZYME:

Coenzyme :(Introduction and Properties) Nicotinamide coenzymes - NAD+ and NADP+- (Structure andFunction) .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)Pyruvatedehydrogenase–(Mechanism&reactions)

UNIT-IV :ENZYMEIMMOBILIZATION

Enzyme Immobilization (Introduction – Definition.) Methods of immobilization – (Principle and Types)Adsorption,Covalentbonding,Crosslinking.Encapsulation,Entrapment,Advantageofimmobilizationprocess–(Advantageinimmobilizationtechniquesinindustryaspects)Applicationsofimmobilizedenzymes –(Componentsofanalyticalsystems,continuouslyoperatedprocess)

UNIT-V :APPLICATION OF ENZYMES :

Roleofenzymeinmedicine-Treatmentofvariousdiseases(Asparginase,Collagenase,Urokinase,Streptokinase) Food and drink industries – (Baking of bread, brewing industries.)Other industries – (Washingpowders, Immobilized glutamate dehydrogenase linked to alcohol dehydrogenase) Role of enzymes in FreeRadicalScavenging–(SOD,GSHReductase,Catalase,Etc.) Enzyme Biosensor: Introduction – (Definition and Principle) Types and Applications - Colorimetric, Optical&immunosensor.(Principleandapplication)EnzymeinIndustrialaspects –(RoleinFood&Textileindustry

TextBooks:

T1-FundamentalsofEnzymology|Edition:2|OxfordSciencePublications,Newyork.|Nicholasc.price,Lewis stevens 2019

T2 - Enzymes - Biochemistry, Biotechnology, Clinical chemistry. | Edition:3 | East west Press PvtLtd,NewDelhi.|TrevorPalmer.andPhilipbonner(2020)

ReferenceBooks:

R1–LehningerPrinciplesofBiochemistry,David.L.Nelson,MichaelM.Cox.Eightedition,2021.

R2- Harper's Illustrated Biochemistry, Victor Rodwell, David Bender, Kathleen Botham and PeterKennelly,ThirtyFirstEdition-May-2018.

Semester	:**III**	CourseGroup:**DSC-V**
Teaching SchemeinHrs(L:T:P):**0:0:4**		Credits:**2Credits**
MapCode	:**H(PRACTICAL EXPERIMENTS)**	TotalContactHours**60**
CIA	: **40Marks**	SEE :**60Marks**
Programme:**BSC-BC**		

List of experiments

1. Determinethe pHonthe activityofSalivaryAmylase

2. Determine the TemperatureontheactivityofSalivaryAmylase

3. Determine thepHontheactivityofAlkaline Phosphatse

4. Determine the TemperatureontheactivityofAlkalinePhosphatse

5. DeterminethepHontheactivityofCatalase

6DeterminetheTemperatureontheactivityofcatalase

7 DeterminethepH ontheactivityofAcidPhosphatase

8 DeterminetheTemperatureontheactivityAcidPhosphatse

9. Determinethe SODEnzymeactivity

10. DeterminationofGSHReductaseactivity

Course Title :**Bioenergetics & Metabolism**	Course Code : 33B
Semester : **III**	Course Group : **DSC-VI**
Teaching Scheme in Hrs (L:T:P) : **4:4:0**	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	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 oxidativephosphorylation,substratelevelphosphorylationwithexamples.

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, AmphibolicnatureandintegratingroleofTCAcycle.Anaplerosis,Pentose Phosphate Pathway (HMP shunt), Gluconeogenesis, Glycogenesis, Glycogenolysisanditsregulation, glyoxylate cycle, Entner- Duodoroff pathway andCoricycle.

UNIT-III

Metabolism of lipids -Oxidation of fatty acids - α, β and ω -oxidation of saturated fatty acids, Oxidation of fatty acids with odd number ofcarbonatomsandunsaturatedfattyacids,Ketogenesis,Biosynthesis of saturated fatty acids and unsaturated fattyacids,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 aminoacids-(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**).

Metabolismof 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 LubertStryer, 4th 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.MayesRodwell,2018, Rev edition.

2. Principles of Biochemistry, Zubay Geoffrey, McGraw publishers, 2017, 5th edition.
3. Textbook of Biochemistry, 2016 LubertStryer, 4thEdition, W.H.Freeman& co.

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

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

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 MadhanS.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 miftin company new york

2. M.Satake,Y.Hayashi(2003),Colloidal and Surface chemistry,Discovery publishing house

SEMESTER IV

Semester	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
IV	MIL – IV	Tamil - IV	3	4	-	-	25	75	100	3

Course Title : **TAMIL IV (T)**	Course Code : 41T
Semester : **IV**	Course Group : **MIL - IV**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : 3
Map Code: A (Language- Concepts)	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # : **75 Marks**

Programme: **ALL UG PROGRMMES** **Semester End Exam**

No.	Course Outcomes (Cos): After completion of this course, the students will be able to	POs	CL. Ses	CL
CO1	□□□□ □□□□□□□□□□□□□ □□□□□□□□□□ □□□□□□□□□□ □□□□□□□□□□ □□□□□□□□ □□□□□□□□	PO7	15	U
CO2	□□□□□□□□ □□□□□□□□□□□□□ □□□□□□□□□□□□□□□□□□□□□□□ □□□□□□□□ □□□□□□□□□□	PO2	12	R
CO3	□□□□□ □□□□□□□□□□ □□□□□□ □□□□□□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□□ □□□□□□□□□□	PO8	13	AP
CO4	□□□□□□□□□□□□□□□ □□□□□□□□□ □□□□□□□□□□ □□□□□□□□□□□□□□□□□ □□□□□□□□ □□□□□□□□	PO2	10	AP
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Semester	Course Opted	Course Name	D	L	T	P	CIA	ESE	Marks	Credits
IV	MIL – IV	HINDI-IV	3	4	-	-	25	75	100	3

SEMESTER-IV

Course Title :**HINDI-IV (T)**	Course Code : 24H
Semester : **IV**	Course Group : **MIL - IV**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : 3
Map Code: A (Language- Concepts)	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # : **75 Marks**

Programme: **ALL II YEAR 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	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 hindikagyankaisebadana,ComputerkaParchayaurVikas, Computer mein Hindi keVividh Font jaisekikruti dev, mangalarielaadikagyanbadana,)

UNIT II **LECTURE HOURS: 12**

Proudyogikiaur Hindi:(Unicode, DewanagariLipi, Hindi kiVibhinna Website – EkParichay, Wikipedia kepratigyanbadana)

UNIT III **LECTURE HOURS: 12**

Computer kemadhyam se Hindi:(shikshanaur E-Learning, Vibhinna E-Learning Sansadhan, Sarkariaurgairsarkarisansthanonmeinprayukt 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 kokaparichaydena, khud)

UNIT V **LECTURE HOURS: 12**

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

Text &Reference Books

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

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

MALAYALAM

Course Title : MALAYALAM – IV (T)	Course Code : 24M
Semester : **IV**	Course Group : **MIL - IV**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **3Credits**
Map Code:**A (Language Concept)**	Total Contact Hour : 60

CIA	: 25 Marks	SEE	: 75 Marks
Programme	: II Yr ALL UG PROGRAMMES # - Semester EndExam		

ACADEMIC YEAR 2023-2024

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: Photoeditor,Webdesigner, Graphic designer, DTP,OperatorLogo, Designer, Digitalillustrator,PatternMaker, StationaryDesigneretc	PO3	12	AP
CO2	Interpretthedifferentstylesof photoshops	PO3	12	U
CO3	Apply different images and layouts for invitationmaking	PO2	12	AP
CO4	Explainthestyleofcaptionwriting	PO4	12	U
CO5	Interpretthestyleofcontemporaryhigh-resolutiontechnologyforbrochuremaking	PO3	12	U

UNIT -I **LECTURE HOURS: 12**

DesktopPublishingandPrintinginMalayalam

(This unit introduces basic of the printing technology and Dataentering, DTP editing and layout. Book publishing. SignificanceISBN,andISSN)

UNIT -II **LECTURE HOURS: 12**

DesktopPublishingandPrintinginMalayalam

(AboutthelimitsofMSPaint-PresentationandsetupofuserinterfaceandhelpOpenandsaveanimage-Knowledgeofavailablefiletypes(JPG,TIFF,ICO,PNG,GIF...) -Setopened imageasdesktopwallpaper-Displayoptions(zoom,miniature grid, etc.) -Define or resize the size of an image (nonfunctionaltransparency), Drawing tools overview, Colors selection withright click/left click in the palette, Copy/Paste from selectionwithorwithouttransparency, insertanexternalimageinacompositionWorkingfordifferentimageandresolutionandchangingtheresolution.Editingphotographsfromourownalbums & images Scanning images, and how to assimilate colortones)

UNIT - III **LECTURE HOURS: 12**

DesktopPublishingandPrintinginMalayalam

(Painting &editing tools Painting toolspainting tooloptions,paintbrush tool, brushes palette, creating a new brush, undo,history brush tool, art history brush tool, gradient tool, paintbucket tool. Drawing tools Drawing basic geometric shapes,customshapetool.EditingtoolsBlurtool,sharpentool,smudgetool, clone stamp tool, pattern stamp tool. Toning tools Dodgetool,burntool.Erasertools129Erasertools,backgrounderasertool,magicerasertool, slicetool.)

UNIT - IV **LECTURE HOURS: 12**

DesktopPublishingandPrintinginMalayalam

(Layers Layer palette Working with layers, creating a new layer,selecting, hiding/showing,deleting,sorting,repositioning,merging, linking and transforming layers, layers effects, rotatingskewing, flipping & distorting layer. This unit introduces the LayersLayerpaletteWorkingwithlayers,creatinganewlayer,selecting,hiding/showing,deleting,sorting,repositioning,merging,linkingandtransforminglayers,layerseffects,rotatingskewing,flipping&distortinglayer)

UNIT - V **LECTURE HOURS: 12**

DesktopPublishingandPrintinginMalayalam

(Proofreading techniques and cataloging, cove designing, blurbwriting)

TEXT BOOKS:

T1. pusthakanirmaanam-ThestatelanguageInstitute,Kerala
T2. Proffreadingourkala-ThestatelanguageInstitute,Kerala

T3. PrintingAtoZ-K.J.Samkutti
T4.inivaayanaEvayana-V.K.Adarsh,D.C.books,Kottayam
T5. PrintTechnology and Compositing- The StateLanguage Institute,Kerala

T6. Bookstoligia-P.K.Rajasekharan-Mathrubhumibooks
T7.PusthakamUntakunnathu-V.K.Haridas,PoornaPublications,Kozhikode
T8.AnIntroductiontoBookPublishing-DRaghavan
T9.CopyEditing-JudithButcher

REFERENCES:

R1. EMalayalam/cyberMalayalam-SunithaT.V.
R2. https://www.amazon.com/Desktop-Publishing-Bittu-Kumar/dp/9350570130

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

Course Title : **FRENCH-IV (T)**	Course Code : **41 F**
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: **ALL II 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	Comprendre des instructions de cuisine, Mettreengarde, Communiquer au restaurant, Exprimersa 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	Exprimersa 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, Parlerd'unevisitetouristique, 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 votresante ! - (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: Consommerresponsable - (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 | ViolettePetitmengin | Marlene Dodin (DELF) | Julie Veldeman-Abry (Phonetique) | (April, 2022)

Reference Books:

R1. Larousse – Dictionnairebilingue | 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 ii) verb2verbe.com iii) tolearnfrench.com

Course Title :**CLINICAL BIOCHEMISTRY & CLINICAL LAB TECHNOLOGY**	Course Code : 43B
Semester : **IV**	Course Group : **DSC-VI**
Teaching Scheme in Hrs (L:T:P) : **4:4:0**	Credits : **4 Credits**
Map Code : **C(THEORY CONCEPTS)**	Total Contact Hours : **60**
CIA : **25 Marks**	SEE : **75 Marks**
Programme: **BSC-BC**	

No	Course Outcome (Cos): After completion of this course, the students will be able to	Pos & PSOs	Cl. Ses	BLOOM'S TAXONOMY LEVEL
CO1	Understanding the pathophysiology and of the most prevalent diseases.	PO1& PS01	15	U
CO2	Discuss the fundamental biochemistry knowledge related to health	PO1& PS01	15	Ap
CO3	Evaluate the abnormalities which commonly occur in the clinical field	PO1& PS01	12	U
CO4	Discuss the fundamental biochemistry knowledge related to lipid metabolism	PO1& PS01	12	Ap
CO5	To understand the basic functional test	PO1& PS01	12	An

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. (12 hrs)

Hematology

Total and differential counting of leukocytes. RBC counting. Prothrombin time and hematocrit Types of anaemias, hemophilias.

Practical

1. Separation of serum and plasma from blood
2. Estimation of haemeogloblin concentration in blood

UNIT II

DISORDERS OF CARBOHYDRATE METABOLISM

Homeostatsis- Regulation of blood sugar,

Diabetes mellitus and Diabetes insipidus - hypoglycemia, hyperglycemia fasting blood glucose and post pandrial glucose leve. Ketonuria, ketosis.

Galactosemia- causes, symptoms and treatment

Glycosuria - types of glycosuria.

Glycogen storage disease- introduction, types, clinical manifestation, symptoms and treatment

Practicals;

1. Estimation of Glucose by anthrone method
2. Estimation of Glycogen by anthrone method

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's 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

Practicals.

1. Estimation of urea by TSC DAM method method
2. Estimation of RNA by orcinol method

UNIT IV

Diseses related to lipid metabolism:

Disorder associated with lipoproteins

Hyperlipoprotenimea& hypo protein lipoprotenimea- Introdcution, clinical manifestation and treatment

Atherosclerosis-Introdcution, clinical manifestation and treatment

Fatty liver- Introdcution, clinical manifestation and treatment

Arteriosclerosis -Introdcution, clinical manifestation and treatment
Lipid storage disease
Taysach's disease - Introdcution, clinical manifestation and treatment
Niemann - Pickk diseases-Introdcution, clinical manifestation and treatment

Practical

1. Estimation of the total amount of lipids by colorimetry method
2. Estimation of triglyceride

UNIT V

Liver Function tests

PT, jaundice-types, clinical features and test based on bile pigments level in blood and urine, plasma changes,

Gastric function tests

Collection of gastric contents, examination of gastric residium, FTM, stimulation tests, tubeless gastric analysis.

Renal function tests

Clearance tests-urea, creatinine, inulin, PAH test, concentration and dilution tests.

Reference book

1.M.N. Chatterjee &Ranashinde, Text Book of Medical Biochemistry. Jaypee Brothers Medical Publisher (P) Ltd. 6th edition (2006). 2. Carl A. Burtis, Edward R. Ashwood and David E. Bruns (eds), Tietz Textbook of Clinical Chemistry and Molecular Diagnosis. 5thedition, 2012.

2. Thomas M. Devlin, Biochemistry with clinical correlation. John Wiley & Sons. 7thEd, 2010.

3. Allan Gaw, Michael J. Murphy, Rajeev Srivastava, Robert A. Cowan, Denis St. J. O'Reilly, Clinical Biochemistry, 5th edition, 2013. 3. Graham Basten, Introduction to Clinical Biochemistry, Interpreting Blood Results. Book Boon. 2 nd edition, 2011.

Course Title : **CLINICAL BIOCHEMISTRY & CLINICAL LAB TECHNOLOGY**	Course Code : 43P
Semester : **IV**	Course Group : **DSC-VI**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits : **4 Credits**
Map Code : **H (THEORY CONCEPTS)**	Total Contact Hours : **60**
CIA : **25 Marks**	SEE : **75 Marks**
Programme: **BSC-BC**	

LIST OF EXPERIMENTS

1. Separation of serum and plasma from blood
2. Estimation of haemeogloblin concentration in blood
3. Estimation of Glucose by anthrone method
4. Estimation of Glycogen by anthrone method
5. Estimation of urea by TSC DAM method method.
6. Estimation of RNA by orcinol method
7. Estimation of the total amount of lipids by colorimetry method
8. Estimation of triglyceride

Course Title :**Molecular Biology**	Course Code : 43B
Semester : IV	Course Group : **DSC-VII**
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**			

UNIT-I (LECTURE HOURS: 18)

Introduction

DNA, RNA, Protein and Central dogma

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSO	Cl.Ses	BLOOM'S TAXONOMY LEVEL
CO1	Understand the scientific process in the content of learning the fundamentals of molecular biology.	PS01	12	U
CO2	Illustrate the experimental process in the compounds of molecular biology.	PS01	12	AP
CO3	Illustrate DNA replication, DNA repair mechanism and mutation.	PS02	12	AP
CO4	Analyze the mechanism of transcription	PS02	12	AN
CO5	Analyze the mechanism of translation	PS03	6	AN
CO6	Examine gene regulation.	PS03	6	AN

Organization of eukaryotic chromosome

Fundamental unit of chromatin. Types and properties of histones. Chromatin assembly. DNA carries genetic information, Transformation, Transduction, Conjugation, Griffth'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.
Techniques of Molecular Biology

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, 9th Edition, 2019.
2. Molecular Cell Biology, Harvey Lodish, 8th Edition, 2018.
3. Molecular biology of the Gene, Watson, Steitz, Hopkins,Roberts, 4th Edition , 2016.

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

LIST OF EXPRIMENTS:

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: **BIOSTATISTICS**	Course Code : 43E
Semester: I**V**	Course Group : **DSE - II**
Teaching Scheme in Hrs. (L: T): **4:0:4**	Credits :6
Map Code: **C (THEORY)**	Total Contact Hours: 72

CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **BSC-BC**	**# - Semester End Exam**

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 studiesabout 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 | DrS.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)

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

No	Course Outcome (Cos): After completion of this course, the students will be able to	POs	Cl. Ses	Bloom's Taxonomy Level
CO1	Recall the Numbers, H.C.F and L.C.M and apply the	**PO5 &**	**9**	AP

	problems on number simplification and the ability to face the test and interview conducted by different companies and succeed.	**PO6**		
CO2	Illustrate the Percentage, Profit and Loss, Simple and Compound Interest and solve them.	**PO5 & PO6**	**9**	AP
CO3	Understand and Solve the Ratio, Problems on ages, Time & Distance and also prepare to appear in different competitive exams.	**PO5 & PO6**	**9**	AP
CO4	Practice the problems on Trains, Time and Work. It will enhance students problem-solving skill.	**PO5 &PO6**	**9**	AP
CO5	Understand and solve logical thinking and analytical abilities.	**PO5 &PO6**	**9**	AP

UNIT- I

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

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

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

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

UNIT- V

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. BharatiKrsnaTirthaji, Maharaja, Vedic Mathematics, MotilalBanarsidass 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

	Course Outcome (Cos): After completion of this course, the students will be able to			**BLOOM'S TAXONOMY LEVEL**
No		**PSOs**	**Cl.Ses**	

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

CO1	Learn the basic techniques and experiments to explain the genetic material and to its 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 : **GENETIC ENGINEERING**	Course Code : 63Q
Semester : V	Course Group : **DSC-IX**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits : **2**
Map Code : H	Total Contact Hours: **48**
CIA : **40 Marks**	SEE : **60 Marks**

Programme: **BSC-BC**

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 CaCl2 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, immunogenecity 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 (Recombinanat 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	

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
   a) Single immuno diffusion
   b) Double immuno diffusion
11) RIA

12) Western Blotting

13) Anti inflammatory Kit method
14) CRP
15) 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, toreduce heal thriskand 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 over come 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 pathogenecity - Occurance 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 Domicilary 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

Course Title	**:DRUG BIOCHEMISTRY (T)**	**CourseCode**	**:**
Semester	**: VI**	**CourseGroup**	**: DSC - XI**
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): 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.

UNIT II

THEORY

Absorption - Passive Diffusion, Acitve 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, aminoacid conjugation and glutathione conjugation

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

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

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

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.

Text Books:

1. Satoskar, R.S. and Bhandarkar, S.D. (2013).Pharmolocology 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 Editon, Lippincotts Illustrated reviews, Lippincott Williams & Wilkins publishers, North America.

Course Title :DRUG BIOCHEMISTRY (P)	**CourseCode : 63P**
Semester : VI	**CourseGroup : DSC - XI**
Teaching Scheme in Hrs (L:T:P) : 0:0:4	**Credits : 4 Credits**
Map Code: C (THEORY - CONCEPTS)	**Total Contact Hours :60**
CIA : 40 Marks	**SEE# : 60 Marks**
Programme : B.SC., BC	**# - Semester End Exam**

LIST OF EXPERIMENTS

1. Drug Solubility and Partition Coefficient Measurement

2. Protein-Ligand Binding Assay Using Spectroscopy

3. In Vitro Drug Metabolism Assay Using Liver Enzymes

4. Determination of Drug Half-Life Using Simulated Data

5. Enzyme Inhibition Assay (e.g., for Acetylcholinesterase or Protease Inhibitors)

6. Study of Drug Effects on Cell Viability Using MTT Assay

7. Simulated Antibiotic Sensitivity Testing (Kirby-Bauer Method)

8. Toxicology Study Using Daphnia Bioassay

9. Detection of Drug Dependence through Simulated Data Analysis

10. Basic Bioinformatics Exercise for Drug Discovery

11. Simulation of Personalized Medicine Using Genetic Data

Course Title :PLANT BIOCHEMISTRY (T)	**CourseCode : 63B**
Semester : VI	**CourseGroup : DSC - XII**
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): 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. Passiveabsorption
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.
Abscicic 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 - Undifferetiated masses of cells
Micropropagation - Applications.
Biochemical changes during senescence. - Introduction
Protoplast fusion - Polyethylene glycol
Activty
1 - Make a chart for preparation of agar medium
2 - Collect the procedure for callus culturing
Text Books :
Fundametals 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

Course Title :PLANT BIOCHEMISTRY (P)	**CourseCode : 63Q**
Semester : VI	**CourseGroup : DSC - XII**
Teaching Scheme in Hrs (L:T:P) : 0:0:4	**Credits : 4 Credits**
Map Code: C (THEORY - CONCEPTS)	**Total Contact Hours :60**
CIA : 40 Marks	**SEE# : 60d Marks**

Programme	: B.SC., BC	# - Semester End Exam

Isolation and Estimation of starch from potato (Anthrone method)

Estimation of total free Amino Acid in plant tissues

Estimation of Beta Carotenoids in carrots

Separation of chlorophyll pigments by column chromatography

Determination of macronutrients- Calcium, Phosphorus

Determination of macronutrients- Iron, Copper

Assay of Urease Enzyme Activity

Quantitative measurement of IAA

Streilization and media preparation

Callus induction and micro propagation

Course Title :**RECOMBINANT DNA TECHNOLOGY**	Course Code : **63C**
Semester :**VI**	Course Group : **DSE V**
Teaching Scheme in Hrs (L:T) : **6:0:0**	Credits : **6**
Map Code: -	Total Contact Hours: **90**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme**: BSC-BIOCHEMISTRY**	# - Semester End Exam

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	BLOOM'S TAXONOMY LEVEL
CO1	Illustrate the basic techniques involved in recombinant DNA manipulations including DNA restriction, ligation, transformation and selection of recombinant plasmid.	PSO 1	18	U

CO2	Summarize the functions of several vectors used in cloning and Devise their own cloning strategies for DNA	PSO 1	18	U
CO3	Illustrate the creative use of modern tools and techniques for manipulation and analysis of genomic sequences.	PSO 1	18	AP
CO4	Categorize the application of recombinant DNA technology in biotechnological research and Construct cDNA and genomic DNA libraries	PSO 2	18	AN
CO5	Analyze the strategizing research techniques employing in recombinant DNA technology and the methods used for analyzing the prepared gene sequences.	PSO 2	18	AN

UNIT I

Introduction to Recombinant DNA Definition, Recombinant DNA and evolution - Host controlled restriction modification

The range of 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

Activity

DNA manipulating enzymes - 1. Group discussion on various DNA manipulating enzymes

DNA Polymerase - 2. Download animation of mechanism of DNA Polymerase

UNIT II

Vectors- Definition, Properties and its types

Vectors - Definition, Properties of good vectors

Plasmids and Cosmids

Plasmids- Types, Structural and Functional Organization of Plasmids, Cosmids- Principle and cloning

Bacteriophage vector - Lambda phage, M13 single strand phage vector

Yeast cloning vectors - YAC, YEP

Animal viral vector - SV 40

Plant viral vector - Cauliflower mosaic virus vector (CaMV),

Adeno viral vector

Human Artificial Chromosomes

Activity

E.coli vector EcoRI – 1. Use paper models to simulate the process of inserting insulin gene of interest into your E.coli vector EcoRI

Vectors - 2.Display the images of different vectors and make a comparison chart mentioning the difference in vector size and gene holding capacity

UNIT III

Introduction of the vector into suitable host- Gene transfer techniques

Introduction of the vector into suitable host: - Properties of good host, preparation of competent cells

Transformation of DNA to bacterial, plant and animal cells - Transformation -Calcium mediated transformation

Microinjection - Gene transfer to animal cell, plant cell

Lipofection - Gene transfer to Animal cell

Electroporation - Gene transfer to animal cell, plant cell and bacterial cell

Nuclear transplantation - Transgenic sheep

Homologous recombination - Recombinant virus

Natural genetic engineering by Agrobacterium - Ti plasmid, binary vector strategy

Activity

microinjection - 1.Demonstration of microinjection method using models.

Gene transfer methods - 2. Animation depicting the various methods used for introducing vector into suitable host.

UNIT IV

Screening of Recombinants

Reporter genes and selectable marker genes - Neomycin ,hygromycin, green fluorescence protein

Selection of clones having specific DNA insert - colony hybridization, hybrid arrested translation, nucleic acid hybridization, complementation

Immunochemical methods for screening - colony/plaque screening with antibodies

Gene library and Functional genomics

Gene library - Construction cDNA library and genomic library

Functional genomics - DNA chips and microarray gene screen technology; site directed mutagenesis, nucleic acid-protein interactions.

Activity

Microarray - 1.Demonstrate the mechanism of microarray gene screen technology by powerpoint presentation

Screening methods - 2.Group discussion on screening methods for Recombinants

UNIT V

Techniques in Recombinant DNA technology

Blotting Techniques - Southern, Northern, Western blotting

immunological techniques - Enzyme linked Immunoabsorbant Assay

PCR - Making multiple copies of DNA

DNA Finger printing using RFLP - Digesting the DNA and mapping, Applications

RAPD - Randomly Amplified Polymorphic DNA

Chromosome walking and jumping - Identification of neighboring sequences

Expression cloning

DNA sequencing - Chemical and enzymatic method

Hazards of Recombinant DNA technology and regulations

Hazards of rDNA technology and regulations. - Rules and regulation to control the hazards of genetically modified organisms.

Activity

ELISA – 1.Animation depicting the antigen and antibody reaction in ELISA
DNA Fingerprinting - 2.Case study: A person was murdered by an unknown person. How will you find the accused using DNA finger printing

Text Books :

T1-Gene Cloning by T.A.Brown | Edition:5 | BlackWell Publishers, London | T.A.Brown(2006)
T2-Molecular Biotechnology: Principles and Applications of Recombinant DNA | Edition:6 | ASM Press | Bernard R. Glick and Cheryl L. Patten (2022)
T3-Biotechnology | Edition:3 | Book and Allied Kolkata | U Sathyanarayan (2005)
T4-Recombinant DNA Technology | Edition:1 | The Energy and Resources Institute (TERI) | Keya Chaudhuri (2013)
T5-A Complete Guide to Gene Cloning: From Basic to Advanced | Edition:1 | Springer | NayanaPatil and ArunaSivaram(2022)
T6-Immunology | Edition:5 | WH Freeman andcompany NY | Richard AGold boy & Thomas JKindt(2006)

Reference Books :

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