KALAIGNAR KARUNANIDHI

GOVERNMENT ARTS COLLEGE FOR WOMEN (AUTONOMOUS)

(Reaccredited with B⁺⁺ by NAAC)

PUDUKKOTTAI -622 001

DEPARTMENT OF ZOOLOGY

SYLLABUS – UG

(2021 – 2022 Onwards)

KALAIGNAR KARUNANIDHI

GOVERNMENT ARTS COLLEGE FOR WOMEN (AUTONOMOUS),

PUDUKKOTTAI -622 001

DEPARTMENT OF ZOOLOGY – BOARD OF STUDIES

CONTENTS

S.NO	PARTICULARS	PAGE.NO.
1.	Members of Board	03
2.	Distribution of hours, marks and credits for B.Sc Zoology	05
3.	Course pattern for B.Sc Zoology	06
4.	Question paper pattern for B.Sc Zoology	10
5.	Continuous Internal Assessment pattern for B.Sc Zoology	11
6.	New Syllabi for B.Sc Zoology	12

KALAIGNAR KARUNANIDHI GOVERNMENT ARTS COLLEGE FOR WOMEN (AUTONOMOUS) (Reaccredited with B⁺⁺ by NAAC) PUDUKKOTTAI-622 001 DEPARTMENT OF ZOOLOGY - BOARD OF STUDIES

Meeting on 27.05.2020

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2.Dr. SP. Jeyapriya, M.Sc., M.Phil., M.Ed, Ph.D Assistant Professor of Zoology.

3.Dr. G.Sankar M.Sc.,Ph.D., Associate Professor of Zoology.

EXPERT NOMINATED BY VICE CHANCELLOR

Dr.R.Thirumurugan, Associate Professor Department of Animal Science Bharathidasan University Thiruchirapalli– 24

EXPERTS FROM OUTSIDE THE PARENT UNIVERSITY

 Dr.Murugappan Ramanathan Associate Professor &Head Department of Zoology Thiagarajar college Madurai 625 009 <u>Email: hod_zoology@tcarts.in</u> murugu19@gmail.com Mobile.No :9443918665 Dr S.Kalidass MSc (Zoology); MSc (Microbiology);PhD (Biotechnology). Associate Professor Department of Animal Science ManonmaiamSundaranar University Abishekapatti Campus Tirunelveli.627012 Email: <u>kallidass@gmail.com</u> Whatsapp Mobile number: 9443022508

REPRESENTATIVE FROM INDUSTRY/ CORPORATE SECTOR

Rtn .M.Selvakumar, M.Sc., B.L. Tharun Aqua company, Sri Balalj Aqua farm 49/1, R.R.Sethupathynagar, Ramanathapuram – 623501. Mobile Number - 9443130143

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Dr. H. Lavanya M.Sc,Ph.D Assistant Professor, Department of Microbiology, Sri Bharathi Arts & Science College for Women, Kaikkurichi, Pudukkottai – 622 303 Mobile no.7639441809.

KALAIGNAR KARUNANIDHI GOVERNMENT ARTS COLLEGE FOR WOMEN (Autonomous)

PUDUKKOTTAI - 622 001

<u>UG COURSE PATTERN – CBCS</u>

PART	COURSE	NO. OF PAPERS	INST. / HRS	CREDIT	TOTAL MARKS
Ι	Language - Tamil	4	24	12	400
II	Language - English	4	24	12	400
	CORE COURSE	Hours		Credits	Total Marks
	CORE COURSE	15	73	68	1500
III	Allied Course	6	29	18	600
	Major Based Elective	3	14	12	300
IV	Non- Major Elective	2	4	4	200
IV	Skilled Enhancement course				
	VB ES	1	2	2	100
	YOGA	1	2	2	100
		1	1	2	100
	GS	1	1	1	100
	EXA	-	-	1	-
TOTAI		41	180	140	4100

Course pattern for UG Zoology Programme

Sem	S.no	Part	Code	Course Code	Course title	Inst Hrs	Credit	CIA + SE	Marks
Ι	1	Ι	LC-1	21UT1	Language	6	3	25+75	100
	2	II	ELC-1	21UE1	English	6	3	25+75	100
	3	III	CC-1	21UZO01	Invertebrata	6	5	25+75	100
	4	III	CC/Lab	21UZO02P	Major Practical I	4	4	25+75	100
	5	III	FAC-1	21UAB1	Allied Botany course I	6	3	25+75	100
	6	IV	AEC-VB	21UVB	Value Education	2	2	25+75	100
					Total	30	20		600
Π	7	Ι	LC-2	21UT2	Language	6	3	25+75	100
	8	Π	ELC-2	21UE2	English	6	3	25+75	100
	9	III	CC-III	21UZO03	Chordata	5	5	25+75	100
	10	III	CP-1I	21UZO04P	Major Practical II	4	4	25+75	100
	11	III	FAC-II	21UAB2	Allied Botany course II	5	3	25+75	100
	12	III	FAC-III	21UAB3P	Allied Botany course - Practical	4	3	75+25	100
					Total	30	21		600
III	13	Ι	LC-3	21UT3	Language	6	3	25+75	100
	14	II	ELC-3	21UE3	English	6	3	25+75	100
	15	III	CC-5	21UZO05	Animal Physiology and Biochemistry	6	5	25+75	100
	16	III	CC-6	21UZO06P	Major Practical III	5	5	25+75	100
	17	III	SAC-1	21UAC1	Allied Chemistry - I	5	3	25+75	100
	18	IV	AEC-ES	21UES	Environmental Science	2	2	25+75	100
			SS1	21UZOSS1	Ornamental fish culture	-	2	25+75	100
					Total	30	21		700
IV	19	Ι	LC-4	21UT4	Language	6	3	25+75	100
	20	Π	ELC-4	21UE4	English	6	3	25+75	100
	21	III	CC-7	21UZO07	Developmental Biology and Biodiversity	4	4	25+75	100
	22	III	CP-8	21UZO08P	Major Practical IV	3	3	25+75	100
	23	III	SAC-2	21UAC2	Allied Chemistry - II	5	3	25+75	100
	24	III	SAC-3	21UAC3P	Allied Chemistry – III - Practical	4	3	25+75	100
	25	IV	SEC-1	21UZOSEC1	Pathology And Clinical Laboratory – I	2	2	25+75	100

			SS2	21UZOSS2	Apiculture		2	75+25	100
					Total	30	21		700
V	26	III	CC-9	21UZO09	Cell and Microbiology	5	5	25+75	100
	27	III	CC-10	21UZO10	Genetics and Molecular Biology	5	5	25+75	100
	28	III	CC-11	21UZO11	Biotechnology	4	4	25+75	100
	29	III	CP-12	21UZO12P	Major Practical V	5	5	25+75	100
	30	III	ME-I	21UZOME1	Applied Entomology	4	4	25+75	100
	31	IV	SEC-2	21UZOSEC2	Pathology And Clinical Laboratory – II	2	2	25+75	100
	32	IV	SEC-3	21UZOSEC3	Soft Skill for Professionals	2	2	25+75	100
	33	IV	NME-1	21UB0NME1	Botanical garden and Land Scaping	2	2	25+75	100
	34	IV			Yoga	1	1	25+75	100
					Total	30	30		900
VI	35	III	CC-13	21UZO13	Environmental Biology and Management	5	5	25+75	100
	36	III	CC-14	21UZO14	Immunology and Evolution	6	5	25+75	100
	37	III	CP-15	21UZO15P	Major Practical VI	6	5	25+75	100
	38	III	ME-2	21UZOME2	Biophysics, Biostatistics and Bioinformatics	5	4	25+75	100
	39	III	ME-3	21UZOME3	Bioinstrumentation	5	4	25+75	100
	40	IV	NME-2	21UBONME2	Preservation of Fruits and Vegetables	2	2	25+75	100
	41	V	GS	21UGS	Gender Studies	1	1	25+75	100
	42	V	EXA	21UEXA	Extension Activities	-	1	-	-
					Total	30	27		700
					Gross total	180	140		4100

Self Study Course: 2 Self Study Course Total: 200 Total credits: 4

COURSES OFFERED BY THE DEPARTMENT

S.NO	SUB.CODE	TITLE OF THE PAPER	INS.HRS	CREDITS
	I	CORE COURSES	I	I
1	21UZO01	Invertebrata	6	5
2	21UZO02P	Major Practical I	4	4
3	21UZO03	Chordata	5	5
4	21UZO04P	Major Practical II	4	4
5	21UZO05	Animal Physiology and Biochemistry	6	5
6	21UZO06P	Major Practical III	5	5
7	21UZO07	Developmental Biology and Biodiversity	4	4
8	21UZO08P	Major Practical IV	3	3
9	21UZO09	Cell and Microbiology	5	5
10	21UZO10	Genetics and Molecular Biology	5	5
11	21UZO11	Biotechnology	4	4
12	21UZO12P	Major Practical V	5	4
13	21UZO13	Environmental Biology and Management	5	5
14	21UZO14	Immunology and Evolution	6	5
15	21UZO15P	Major Practical VI	6	5
16	21UZO16	Sericulture	5	5
17	21UZO17	Animal Behaviour and Neuro Physiology	5	5
18	21UZO18	Health and Hygiene	5	5
	1	DEPARTMENTAL ELECTIVE	1	1
19	21UZOME1	Applied Entomology	4	4

20	21UZOME2	Biophysics, Biostatistics and Bioinformatics	5	4			
21	21UZOME3	Bioinstrumentation	5	4			
22	21UZOME4	Human Nutrition	5	4			
23	21UZOME5	Fish Processing Technology	5	4			
24	21UZOME6	Wild life Conservation	5	4			
	NON MAJOR ELECTIVE						
25	21UZONME1	Aquaculture	2	2			
26	21UZONME2	Vermiculture	2	2			
SELF STUDY PAPERS							
27	21UZOSS1	Ornamental fish culture	2	2			
28	21UZOSS2	Apiculture	2	2			
	AI	LLIED ZOOLOGY FOR B.SC BOTA	NY				
29	21UAZ1	Biology of Invertebrates and Chordates	4	3			
30	21UAZ2P	Practical Zoology	3	3			
31	21UAZ3	Commercial Zoology	4	3			
SKILL ENHANCEMENT COURSES							
32	21UZOSEC1	Pathology And Clinical Laboratory – I	2	2			
33	21UZOSEC2	Pathology And Clinical Laboratory – II	2	2			
34	21UZOSEC3	Soft Skill for Professionals	2	2			

PART	ТҮРЕ	Qn.NO	UNIT	Marks for each Qn	Total Marks	
Α	Answer all the	1 &2	Ι			
	Questions	3&4	II			
		5 & 6	III	2	20	
		7 &8	IV			
		9&10	V			
В	Internal choice	11a/11b	Ι			
	Answer all the Questions	12a/12b	II		25	
		13a/13b	III	5		
		14a/14b	IV			
		15a/15b	V			
С	Answer any	16	Ι			
	three Questions	17	II			
		18	III	10	30	
		19	IV			
		20	V			
	External Marks				75	
	CIA				25	

B.Sc., ZOOLOGY - QUESTION PAPER PATTERN – Part I, II , III, IV & V

Max. Marks	100*
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CONTINOUS INTERNAL ASSESMENT PATTERN – UG

THEORY

Exam	Max.Marks	Converted to
MidSem	40	5
End Sem	40	5
Model	75	10
Assignment	10	5
	Total	25

PRACTICAL

External

	Practical	: 75
	Total	: 75
Internal:		
Model Exam		: 10
Performance	in the class	: 15
Total		: 25

New syllabi for B.Sc Zoology

Course code	21UZO01	INVERTEBRATA	L	Р	С			
Core/Elective/Supp	ortive	CORE COURSE: I	06		05			
Course Objectives:			L					
The main objective	s of this course	are to:						
1. Understand	the level of o	organization in animal kingdom from unicellul	ar organism	to multi	-cellular			
organism.								
2. Understand	the classificatio	n, characteristics and analyze the structural organi	zation of Prot	ozoa				
3. Understand	the classificat	ion, characteristics and analyze the structural	organization	of Porif	era and			
Coelenterata	ι.							
4. Learn thecla	ssification, cha	racteristics and analyze the structural organization	of Helminthe	s, Nemat	ode and			
Annelids.			C) (11					
5. Studythe cla	ssification, cha	racteristics and analyze the structural organization	of Mollusca a	and				
Echinoderm	ata.							
Unit•1				18 HOL	IRS			
Unit.1		Binomial nomenclature & Protozoa		10 1100	'NO			
1.1 Outline classific	ation of Inverte	brates upto class.						
1.2 Detailed study –	Paramecium	*						
1.3 General Topics	Nutrition and	Reproduction in protozoa.						
1.4 Protozoan paras	ites in human b	eings.						
Unit:2		Porifera &Coelenterata		18 HOU	RS			
2.1 Detailed stu	dy: Sycon -Scyp	oha.						
2.2 General topi	cs: Canal syste	m and reproduction in sponges.						
2.3 Detailed stu	dy : <i>Obelia</i> ,							
2.4 General topi	cs: Corals and	coral reefs,						
2.5 Polymorphis	sm in coelentera	ites .						
U 4 3				10 1101	DC			
Unit:3		Helminthes & Annelida		18 HOU	KS			
3.1 Life cycle o	f Taenia solium	and Ascaris.						
3.2 Nematode p	arasites – Ancvl	ostoma. Wuchereriaand Enterobius.						
3.3 Detailed stu	dy : Earthworm	•						
3.4 General topi	cs : Adaptive ra	diation in Annelida,						
3.5 Excretion in	n Annelida.							
Unit:4		Arthropoda		18 HOU	RS			
4.1 Detailed stu	dy – Cockroach							
4.2 Prawn (Appendages only)								
4.3 General topi	cs: Affinities of	f Peripatus,						
4.4 Mouth parts	and their modi	fications in insects,						
4.5 Insect metar	4.5 Insect metamorphosis.							
Unit:5		Mollusca & Echinodermata		18 HOU	RS			
5.1 Detailed stu	dy – Pila globo	<i>sa</i> .						
5.2 General topi	cs : Cephalopo	da as an advanced mollusca,						

5.3 Torsion in mollusca.						
5	.4 Detailed study – Star fish.					
5	5.5 General topics : Larval forms and their significance.					
	Total Lecture hours	90 HOURS				
Expe	ected Course Outcomes:					
On t	he successful completion of the course, student will be able to:					
1.	Recall the emergence and diversity of invertebrate fauna.	K1				
2.	2. Outline the classification, characteristics and analyze the structural organization of Protozoa.					
3.	3. Identify the classification, characteristics and analyze the structural organization of Porifera and Coelenterata.					
4. Compare the classification, characteristics and analyze the structural organization of Helminthes, Nematode and Annelids.						
5. Elaborate the classification, characteristics and analyze the structural organization of Mollusca and Echinodermata.						
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create					
Text	book(s)					
1	N. Arumugam, K. Sasi Kumar, 2020, Invertebrates Saras Publication					
2	S. K. Valli and C. Rajasekaran : Muthikelumbatravai Vol. I and II (Bard).					
Reference Books						
1	1 Kotpal R.L. (2013) Invertebrates Rastogi Publication, Meerut					
2	E.L.Jordan and P.S.Verma, (2009) Invertebrate Zoology, S.Chand publications					
Rela	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]					
1	https://www.britannica.com/animal/invertebrate					
Cou	rse Designed By: Dr.P.Kalyani Checked by : Dr. A. Nagasa	thya				

Semester	Co	de		Title of	the Course		Hours		Credits	
I	21U 2	ZO01		Invertebrata			(6	5	
Course		Programn	ne Outcon	nes (POs)		Progr	amme Spe	cific Outco	mes (PSC	Ds)
Outcomes (COs)	P01	PO2	PO3	P04	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
C01	✓	✓	✓	✓	~	✓	✓	✓	✓	✓
CO2	√	✓	✓	✓	✓	✓	✓	√	✓	✓
CO3	✓	□✓		✓	□✓	✓	✓			✓
CO4	✓	✓			✓	✓	✓	✓		✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	
Number of Ma	tches(√)	=44 Relat	ionship :	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code21UZO2PMAJOR PRACTICAL – I INVERTERDATALPC								
Core	/Flective/Sunno	ortive	CORE COURSE: II		04	04		
Cour	se Objectives	личе	CORE COURSE. II		04	04		
The	nain objectives.	of this course	are to:					
1	Enhance their	r practical orie	nted subject knowledge					
2	. Understand t	he structural of	organization of mouth parts and correlate the m	outh parts of	insects	to their		
	feeding habit							
3	. Mount the bo	dy setae of Ea	rthworm and mouth parts of Cockroach.					
4	Dissect vario	us systems of t	he specimens belonging to Invertebrata					
5	. Apply knowl	edge of classif	ication in the identification of specimens of biolog	ical importance	e.			
Disse	ctions							
	Farthworm	·N	ervous system mounting of body setze nineal seta					
	Cockroach	: D	igestive system and nervous system.	ic.				
	Mouth parts	: C	ockroach					
	Ĩ							
Spott	ers							
	Protozoa	: Am	oeba, Euglena, Plasmodium, Paramecium,					
	Porifera	: Syc	con, Gemmule and spicules.	a 1				
Coelenterata : <i>Obelia</i> colony, medusa, <i>Physalia, Aurelia</i> , Sea Anemone, Corals								
	Platyneiminthes: Liver fluke (entire), 1. S. of liver fluke, Tapeworm entire, 1. S. of Tapeworm, Scolex.							
	Nematoda	: Asc	earis male and female, T. S. of male and female					
	Annelida	: Net	ries, Megascolex, Parapodium of Nereis, Arenicola	ı				
	Arthropoda	: Mi	llipede, Centipede, Prawn, Peripatus					
	Mollusca	$\therefore Ch$	iton, Dentalium, Solen, Sepia, Octopus, Mytilus					
	Echinoderma	ita : Starfish,	sea urchin, sea cucumber, Pedicellaria					
		Total Lectur	re hours		90 H	IOURS		
Expe	cted Course Ou	itcomes:		Ι				
On th	ne successful co	mpletion of th	e course, student will be able to:					
1.	Compare and c	contrast the structure	actural organization of mouth parts and correlate th	ne mouth parts	K2			
	of insects to th	eir feeding hat	vits	1				
2.	Identify and u	itilize the kno	wledge of classification in the identification of	specimens of	K3			
	biological imp	ortance.						
3.	Dissect and mo	ount the body s	etae of Earthworm and mouth parts of Cockroach		K4			
4.	Explain differe	ent system of a	nimals through dissection in the laboratory work		K5			
5.	5. Adapt neat drawing and writing skills K6							
K1 -	Remember; K2	2 - Understand	; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6	– Create	•			
Refer	ence Books							
1	P.S. verma	(2010) A Man	ual Of Practical Zoology: Invertebrates, Kindle ed	ition				
Relat	ed Online Cont	tents [MOOC	, SWAYAM, NPTEL, Websites etc.]					
1	https://core	e.ac.uk/downlo	ad/pdf/11017224.pdf					
Cour	se Designed By	: Dr. R. Geetl	a Checked by : D	r. A. Nagasat	hya			

Semester	Co	de		Title of th	e Course		Hours		Credits	
I	21UZ	21UZO02P MAJOR PRA			ACTICAL – I – INVERTEBRATA			4	4	
Course		Programn	ne Outcon	nes (POs)		Pro	gramme S	pecific Outo	comes (PSC	Ds)
Outcomes (COs)	P01	PO2	P03	P04	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
C01		✓	✓	✓	✓		√	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	√	✓	✓	✓
CO3	✓		✓	✓	□✓	✓	√		□✓	✓
CO4	✓	✓	□✓		✓	✓	√	✓		✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	
Number of Ma	tches(√):	=44 Relat	ionship :	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

С	ourse code	21UZO03	CHORDATA	L	Р	С				
Core	/Elective/Suppo	ortive	CORE COURSE: III	05		05				
Cou	rse Objectives:				1	I				
The	main objectives	of this course	e are to:							
1 2 3 4	 Learn the ani Understand the Understand the Understand the 	mal organ syst he classificatio he structure an he structure an	tem and its functional variations from prochordata on and characteristics of different classes of Chorda d functions of various systems in the Amphioxus, d functions of various systems in the Calotes, Pige	to higher ver ates Shark and Fr eon and Rabb	rtebrate rog bit					
5	5. Learn structu	ral variations a	and functional aspects based on their evolutionary	advancemen	t					
	Unit:1		Introduction & Prochordates		18 HO	URS				
1	.1 Classification	of chordates	upto orders with suitable examples.	i						
1	.2 Detailed stud	ly: Amphioxus	,							
1	.3 Detailed stud	y: Cyclostoma	ta							
1	.4 Detailed stud	ly: Petromyzor	<i>1</i> .							
1	.5 General topic	s: Retrogressiv	ve metamorphosis in ascidians							
	Unit:2		Gnathostomata, Pisces & Amphibia		18 HO	URS				
2	2.1 Detailed stud	y: Shark exclu	Shark excluding endoskeleton.							
2	2.2 General topic	s: Dipnoi and	their affinities,							
2	2.3 Migration of	fishes, Access	ory respiratory organs in fishes.							
2	2.4 Detailed stud	y: Frog (Exclu	uding Endoskeleton).							
2	2.5 General topic	s: Adaptation	of Gymnophiona with special reference to mode	of life						
2	2.6 Parental care	in Amphibia.								
	I				10 110	UDC				
	Unit:5		Reptilia		18 ПО	UKS				
3	.1 Detailed stud	v of <i>Calotes</i> (I	Excluding Endoskeleton)							
3	3.2 General topic	s: Identificatio	on of Poisonous and non-poisonous snakes,							
3	3.3 Poisonous ap	paratus, Biting	g mechanism and first aid.							
	Unit:4		Aves		18 HO	URS				
4	.1 Detailed stud	y of Pigeon (E	xcluding Endoskeleton).							
4	.2 General topic	s: Flight adapt	ations,							
4	.3 Flightless bir	ds.								
I	Unit:5		Mammalia		18 HO	URS				
5	5.1 Detailed stud	y of Rabbit (E	xcluding Endoskeleton).							
5	5.2 General topic	s: Dentition in	Mammals.,							
5	5.3 Brief account	t on Monotrem	es and Marsupials.		00 110	UDC				
		Total Lectur	re nours		90 HO	UKS				
Expe	ected Course Ou	itcomes:								
On t	he successful co	mpletion of th	ne course, student will be able to:							
1.	Outline the em	ergence and di	iversity of Chordates		K2					
2.	Identify the ch	aracteristics of	different classes of Chordates		K3					

3.	Compare the morphological and functional aspects of Amphioxus, Shark and Frog.	K4
4.	Explain the morphological and functional aspects of Calotes, Pigeon and Rabbit	K5
5.	Compile the Evolutionary innovation in Chordates belonging to different classes.	K6
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create	
Text	book(s)	
1	Thangamani, T. and N. Arumugam, (2019). A text book of Chordates. Saras Publication	ons.
2	Muthukumarasamy, P. and K. Palanivel, 1990. ThandudaiyaVilangugal. Bard.	
Refe	erence Books	
1	E.L.Jordan and P.S.Verma, (2013) Chordate Zoology, S.Chand publications	
2	Ayyar, E. K. and T. N. Ananthakrishnan, (2009)A Manual of Zoology, Vol. II (Chor Printer & publisher Pvt. Ltd.	data), Viswanathan
Rela	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://opentextbc.ca/biology2eopenstax/chapter/chordates/	
Cou	rse Designed By: Dr.K.Radhika Checked by : Dr. A. Na	ngasathya

Semester	Со	de		Title of the Course			Hours		Credits		
II	21U	ZO03		СНО	RDATES		-	5	5		
Course		Programn	ne Outcon	nes (POs)		Progr	Programme Specific Outcomes (PSOs)				
Outcomes											
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5	
C01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CO3	✓	✓ 🗆		✓	✓ 🗆	✓	✓			✓	
CO4	✓	✓			✓	✓	✓	✓		✓	
CO5	✓	✓	✓	✓		✓	✓	✓	✓		
Number of Ma	tches()	=43Relati	onship : l	High							

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code 21UZO04P MAJOR PRACTICAL II - CHORDATA L P								
Core	/Elective/Suppo	ortive	CORE COURSE: IV	04		04		
Cour	rse Objectives:			1		1		
The I	main objectives	of this course a	re to:					
1	. Enhance their	r practical orient	ed subject knowledge					
$\begin{vmatrix} 2 \\ 2 \end{vmatrix}$. Mount the pla	acold scales of S	hark.					
3	Apply knowl	adae of classific	e specimens belonging to Chordala.	rical importan	60			
5	Enhance goo	d drawing and w	riting skills based on the identification of specin	nens of biolog	ical imp	ortance.		
	8**	<u> </u>		c	<u>, , , , , , , , , , , , , , , , , , , </u>			
Disse	ections							
	Fish	: Dig	estive system of Fishes					
	Shark	: Mo	unting of Placoid scales.					
	Frog	: Mo	unting of brain.(Virtual)					
	Arterial system (Virtual)							
		ven	bus system (virtual)					
Spot	ters							
-	Prochordates	:Amphioxus,As	icidian					
	Cyclostomata	a :Petromyzon						
	Pisces	: Scoli	odon, Narcine, Arius, Echeneis, Hippocampus					
	Amphibia :	Bufo	<i>Hyla</i> , Axolotl larva,					
	Reptilia :	Calo	tes, Draco, Chameleon, Phython, Naja naja, Krai	it.				
	Aves :	Pigeo	on, Owl, Vulture, Kingfisher, Parrot, Kiwi.					
	Mammalia :	Rabb	it, Loris, Bat, Echidnas, Kangaroo.					
		Total Lecture	hours		90	HOURS		
Expe	cted Course Ou	itcomes:						
On t	he successful co	mpletion of the	course, student will be able to:					
1.	Relate the prac	ctical knowledge	of various specimens		K2			
2.	Dissect and mo	ount the placoid	scales of Shark		K4			
3.	Distinguish dif	fferent system of	fishes through dissection in the laboratory work		K4			
4.	Compare the k	nowledge of cla	ssification in the identification of specimens of H	Biological	K5			
	importance.	-		-				
5.	Adapt the neat	drawing and wr	iting skills		K6			
K1 -	Remember; K2	2 - Understand;	K3 - Apply; K4 - Analyze; K5 - Evaluate; K6	– Create				
Refe	rence Books							
1	P.S. Verma,(20	007), A Manual	of Practical Zoology Chordates, S. Chand public	ations				
Relat	ted Online Cont	tents [MOOC, S	SWAYAM, NPTEL, Websites etc.]					
1	https://www.m	llsu.ac.in/econter	<u>nts/</u>					
Cour	Course Designed By: Dr.N.Padmavathi Checked by : Dr. A. Nagasathya							

Semester	Co	de		Title of the Course			Hours		Credits	
II	21UZ	004P	MAJO	MAJOR PRACTICAL II - CHORI				4	4	
Course		Programn	ne Outcon	nes (POs)		Prog	ramme Spe	cific Outco	mes (PSO	s)
Outcomes										
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓			✓		✓	✓			✓
CO4	✓	✓			✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	
Number of Ma	tches(√)	=44 Relat	ionship :	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code 21UZO05 ANIMAL PHYSIOLOGY AND L P							
0			BIOCHEMISTRY	0.6		0.5	
Core	/Elective/Suppo	ortive	CORE COURSE: V	06		05	
Cour	se Objectives:						
The r	nain objectives	of this course	are to:				
	. Understand the	he aspects of N	utrition, Digestion and Respiration.				
	Understand t	he concept of f	excitetion and Circulation	nd Endoaring			
3	Understand t	he structure an	d functions of Biological molecules		nogy.		
5	Understand t	he metabolic n	rocess of Biological molecules				
	. Onderstand a						
Unit:	1	Nutr	ition & Respiration		1	8 HOURS	
			• • • • • •				
1	I Digestion, Al	$\frac{1}{2}$	Assimilation in man				
	.2 Respiratory p	ngments					
1	.5 Transport of	O_2 and CO_2 if	i man				
1		on curve.					
Unit:2 Excretion &Circulation 18 HOURS							
	2.1 Nitrogen	eous wastes –	Ammonotelism. Ureotelism and Urecotelism.	I			
	2.2 Mammal	ian kidney – N	lechanism of urine formation.				
	2.3 Heart in 1	Man Blood –	composition and function				
	2.4 Blood clo	otting, Blood p	ressure and E.C.G.				
	Unit:3		Muscle Physiology		18]	HOURS	
	3.1 Types of	muscles Ultra	structure and contraction of skeletal muscle, Chen	nistry of mus	cular co	ontraction.	
	3.2 Nerve Ph	vsiology–Neu	on – Structure – Types, Nerve impulse and condu	ction.			
	3.3 Endocrin	ology- Secretic	on and Function of Endocrine glands.				
	3 4 Reproduc	tive Physiolog	v = Structure of Male and Female organs				
	5.1 Reproduce	live i hysiolog	j structure of titule and remain organs.				
	Unit:4		Biological molecules		18]	HOURS	
4	1 Structure - Ca	rbohvdrates –	Mono (glucose) di (Sucrose) and polysaccharides	(Starch)			
4	2 Proteins- Prin	nary Structure	Wono (gracose), ar (bacrose) and porysaccharide.	(Buren)			
4	.3 Lipids – Sim	ole lipids.					
4	.4 Vitamins – w	ater and fat sol	uble – occurrence, functions and deficiency diseas	ses.			
			· · · · ·				
	Unit:5		Metabolism		18]	HOURS	
5	.1 Carbohydrate	s - Glycolysis	Citric acid cycle, Glycogenesis, Glycogenolysis.				
5	.2 Proteins – De	amination and	Transamination.				
5	.3 Lipids - Beta	Oxidation.					
5	.4 Enyzmes : Cl	naracteristics o	f enzymes – Mechanism of enzyme action.				
		Total Lectur	re hours		9	0 HOURS	
Expe	cted Course Oi	itcomes:					
On th	ne successful co	mpletion of th	e course, student will be able to:				
1.	Analyze the co	oncepts of abso	rption, assimilation and exchange of gases.		K 4	1	
2.	Comprehend t	he process of	urine formation, types of nitrogenous wastes, role	e of Heart a	nd K5	5	
	Blood circulati	on					

3.	Elaborate about structure, types and functions of Muscle, Nerve cells, reproductive organs	K6
	and hormonal role.	
4.	Recall the structure and functions of biological molecules.	K1
5.	Illustrate different Metabolic process of biological molecules.	K2
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create	
Text	book(s)	
1	Verma, P. S. And V. K. Agarwal, (2017) Animal Physiology. S. Chand and Co.	
2	Rastogi S.C. (2007) Essentials of Animal Physiology	
3.	Bernice Anantharaj, M., 1998. Udalseyalial, Cresolite Publications.	
Refe	rence Books	
1	Nagabushnam, R., (2008). Animal Physiology. S. Chand and Co.	
2	Lehninger, L., (2004). Biochemistry. W. H. Freeman and Co.	
Relat	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://bio.libretexts.org/	
2	https://microbenotes.com/category/biochemistry/	
Cour	rse Designed By: Dr.R. Geetha Checked by : Dr. A. Nagasatl	nya

Semester	Code			Title of the Course				Hours		Credits	
III	2102	ZO05	ANIMAL PHYSIOLOGY AND BIOCHEMISTRY					6	5		
Course		Programm	ne Outcon	nes (POs)		Progr	amme Spe	cific Outco	mes (PSO	s)	
Outcomes											
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5	
C01	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	~	✓ 🗆		✓	✓ 🗆		✓			✓	
CO4	✓	✓			✓	✓	✓	✓		✓	
CO5	~	✓	✓	✓		✓	✓	✓	✓		
Number of Ma	tches(√)	=42Relati	onship : l	High							

Mapping 1 - 20 41 - 60 61 - 80 81 - 100 21 - 40 Matches 1-14 15-29 30-34 35-44 45-50 Relationship Very Poor Moderate High Very High Poor

			MAJOR PRACTICAL III: ANIMAL				
Cours	e code	21UZO06P	PHYSIOLOGY AND BIOCHEMISTRY	L	Р	С	
Core	Elective/S	upportive	CORE COURSE: VI		04	04	
Cour	se Objectiv	ves:		<u> </u>			
The r	nain objec	tives of this course	are to:				
1.	Understa	and the role of temp	erature in salivary amylase activity and oxygen co	onsumption by	fresh wa	ter	
	fishes.	-					
2.	Understa	and and enumerate	the RBC cells, measure the Blood pressure using S	sphygmomanoi	neter.		
3.	Understa	and the aspects of Q	ualitative analysis of Excretory materials		_		
4.	Understa	and the principle in	Qualitative analysis of Proteins, carbohydrates and	d lipids and pH	meter.		
	al Physiol	ogy	have a line in a lating to the second				
1.	Salivary	amylase activity in	numan saliva in relation to temperature.				
2.	Enumer	tion of PBC	na, urea and uric acid.				
	Estimati	on of Ω^2 consumpt	ion in a freshwater fish				
5	Recordin	ig of blood pressure	e using Sphygmomanometer				
Bioch	emistry	-8 of crood pressure	asing ~prij Binomanomotori				
1.	pH meas	surement of various	water samples using pH meter.				
2.	Qualitati	ive test for proteins	carbohydrates and lipids.				
3.	Spotters:	pH meter, Centrifu	ige, Haemocytometer, Thermometer, Sphygmoma	inometer.			
		Total Lecture ho	urs		90 H	IOURS	
Expe	cted Cours	se Outcomes:		i			
On th	e successf	ul completion of th	e course, student will be able to:				
1.	Recall the	e role of oxygen co	onsumption and relationship of temperature in sa	livary amylase	K1		
	activity.						
2.	Summariz	the role of RBC a	and Blood pressure.		K2		
3.	Analyze d	lifferent Excretory	materials.		K4		
4.	Compare	the role of different	Biological Instruments.		K6		
5.	Adapt the	techniques related	to Animal Physiology and Biochemistry.		K6		
K1 -]	Remember	r; K2 - Understand	l; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6	– Create			
Refer	ence Book	S					
1 Plummer, David T.(2004) Introduction To Practical Biochemistry. Tata McGraw-Hill Education Pvt. Ltd.							
Relat	ed Online	Contents [MOOC	, SWAYAM, NPTEL, Websites etc.]				
1	https:/	//www.cbspd.co.in/	aboratory-manual-of-physiology-and-biochemistr	<u>y</u>			
Cour	se Designe	d By: Dr.S.Amudl	na Checked by : I)r. A. Nagasat	hya		

Semester	Co	de		Title of the Course				Hours		Credits	
	21UZ	006P	MA PHY	JOR PRACT	'ICAL III: A ND BIOCHE	NIMAL MISTRY		4	4		
Course		Programn	ne Outcon	nes (POs)	1	Prog	ramme Spe	cific Outco	mes (PSO	s)	
Outcomes (COs)	P01	P02	P03	P04	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
C01		✓	✓		✓	✓	✓	✓	✓	✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓ 🗆	✓	✓	✓ 🗆	✓	✓		□✓	✓	
CO4	✓	✓	✓ 🗆		✓	✓	✓	✓		✓	
CO5	✓	✓	✓	✓		✓	✓	✓	✓		
Number of Ma	Number of Matches(✓)=44 Relationship : High										
Manning	1 20 21			40	41	()	(1 00		01 100		

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21117007	DEVELOPMENTAL BIOLOGYAND	т	р	C
	2102007	EVOLUTION		1	C
Core/Elective/Suppo	ortive	CORE COURSE: VII	06		05
Course Objectives:					
The main objectives	of this course a	nre to:			
1. Understand t	he Theories of d	evelopmental process, Gamatogenesis and Fertil	ization		
2. Understand t	he cleavage patte	erns, morphogenetic movements and organogene	esis and deve	elopmen	ıt of
organs in Fro	og.				
3. Understand t	he various aspec	ts of placentation in mammals and fetal membra	ne in chick.		
4. Learn the Ba	sic theories of O	rigin of Life.			
5. Understand t	he Evolutionary	Process.			
				10 770	TIDA
Unit:1		Developmental Biology		18 HO	URS
1. Theories of o	development –]	Epigenesis, Pangenesis, Biogenetic law, Germ	lasm. Mosaic	c. Regu	lative and
Organizer the	eories.			,8	
1.1 Gametogenes	sis in mammal –	Spermatogenesis, Oogenesis.			
1.2 Structure of	Mammalian Spe	erm and Ovum.			
1.3 Fertilization	– Physiological	changes.			
	, .				
Unit:2		Development stages		18	HOURS
2.1Cleavage planes a	nd pattern				
2.2 Types of Blastula	- Blastulation				
2.3 Gastrulation					
2.4 Morphogenetic m	ovements				
2.5 Fate map	E (E 11				
2.6 Organogenesis in	Frog (Eye and I	Ear).			
Unit:3		Placentation		18	HOURS
3 1 Foetal membrane	s in chick – Cho	rion Amnion Allantois and volk sac			
3.2 Placentation in m	ammals.				
3.3 Classification and	l Physiology of	placenta.			
3.4 Test tube baby.	, ,,				
Unit:4		Evolution		18 HO	URS
4.1 Origin of life.					
4.2 Theories of evol	lution: Lamarck	ism, Darwinism, Neo Darwinism, Devries and	1 Modern Sy	nthetic	theory of
Evolution.					
4.3 Mutation- Gene N	Autation -chrom	osomal aberration and Polyploidy.			-
	T				
Unit:5		Evolutionary processes		18 E	IOURS
5.1 Species Concept	- Speciation- Ge	netic speciation			
5.2 Genetic assi	milation.				
5.3 Mimicry and	l Colouration.				
5.4 Fossils- form	nation and types	of fossils, determination of age of fossils- radio	carbon datin	g.	
5.5 Evolution of	Man.	, e		0	
	Total Lecture	hours		90	HOURS
Expected Course Ou	itcomes:		I		
On the successful co	mpletion of the	course, student will be able to:			
1. Recall the con	cepts and proces	s of developmental process, Gametogenesis and	Fertilization.	K1	
2. Compare the	methodology	of cleavage patterns, morphogenetic mo	ovements ar	nd K2	

	organogenesis and development of organs in Frog.										
3.	Apply the various aspects of placentation in mammals and fetal membrane in chick.	K3									
4.	Analyse the Basic theories of Origin of Life.	K4									
5.	Explain the concept of Speciation, formation, type and determine the age of Fossils.	K5									
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create										
Textbook(s)											
1	Bernice Anantharaj, M., 1998. Karuvial. Cresolite Publications.										
2	Chattopadhyay. S (2012) An introduction to Developmental Biology										
3	Bernice Anantharaj, M., 1998. Parinamam. Cresolite Publications										
4	N. Arumugam, Organic Evolution, Saras Publication										
Refe	rence Books										
1	Balinsky, B. I., 1981. An Introduction to Embryology. W. B. Saunders Company, Philad	delphia.									
2	Verma, P. S., V. K. Agarwal and R. Tyagi, (2006) Chordate Embryology. S. Chand and	Co.									
3	Strickberger, M.W. (2013) Evolution Jones and Bartlett Publishers										
Relat	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]										
1	https://www.biologycorner.com/lesson-plans/evolution-taxonomy/evolution-notes/										
2	https://biolearnspot.blogspot.com/2013/11/bsc-zoology-maain-embryology-notes.html										
Cour	rse Designed By: Dr.P.Kalyani Checked by : Dr. A. Nagas	athya									

Semester	Code		Title of the Course				Hours		Credits	
IV	2102	2007	DEVELOPMENTAL BIOLOGYAND EVOLUTION				6		5	
Course		Programn	ne Outcomes (POs) Prog			gramme Sp	ecific Outo	omes (PSOs	;)	
Outcomes	504	DOO	DOG	504		D (04	DCOO	DCOO	Deed	
(COS)	P01	P02	P03	P04	P05	PS01	PS02	PS03	PS04	PS05
C01	✓		✓		✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓		✓			✓	✓			
CO4	✓	✓				✓	✓		✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of Ma	tches(√)	=41 Relat	ionship :	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course	e code	21UZO08P	MAJOR PRACTICAL IV: DEVELOPMENTAL BIOLOGY AND	L		Р	С		
			EVOLUTION						
Core/	Elective/Suppo	ortive	CORE COURSE: VIII			04	04		
Cours	se Objectives:				•				
The n	nain objectives	of this course a	re to:						
1.	Understand th	he various stages	of chick blastoderm.						
2.	Observe the r	motility of Bull s	perm						
5. 4	Understand th	he concept of eve	plotess of Employology.						
5.	Understand th	he colouration, N	finition and fossil organisms						
Devel	opmental Biolo	ogy	· · · · · · · · · · · · · · · · · · ·						
Disse	ctions								
	1. Temporat	ry mounting of c	hickblastoderm						
Spott	ers	or Dun sperm							
1.	Examination	of prepared micr	oslides to study the following;						
2.	Structure of S	Sperm and Ovum							
3.	Frog- cleavag	ge,							
4.	Yolk plug sta	lge,							
5. 6	5. Blastula, 6. Costrulo								
0. 7.	Placentation i	in Mammals							
Evolu	tion								
1.	Animals of ev	volutionary signi	ficance – Peripatus, Archaeopteryx.						
2.	Homologous	organs – Fore lin	nb – modification						
3.	Analogous or	rgans – wing mo	dification						
4.	Colouration -	– Chameleon, Ly	codon, Krait.						
5.	Mimicry – lea	af insect, Stick in	sect, Monarch and Viceroy Butterfly.						
6.	Fossils – Nau	ıtilus, Ammonite							
		Total Lecture	hours			90 H	OURS		
Expe	cted Course Ou	utcomes:							
On th	e successful co	mpletion of the	course, student will be able to:						
1.	Recall the proc	cedure to observe	e the motility of Bull sperm			K1			
2.	Illustrate the st	tructure of sperm	and ovum of man, various stages of frog Develo	pment		K2			
3.	Identify the var	rious stages of cl	nick blastoderm.			K3			
4.	4. Analyze the difference between the Homologous and Analogous organs and its Evolutionary K4 Significance.								
5.	Examine the pa	attern of coloura	tion, mimicry and Fossil organisms.			K4			
K1 - I	Remember; K2	2 - Understand;	K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 -	- Creat	e				
Refer	ence Books								
1	M.M.Trig	unayat & Kritik	ta Trigunayat, (2019) A Manual of Practical Zoo	ology, S	cientif	ic Publis	sher		

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1https://www.scientificpubonline.com/Course Designed By: Dr.N.Padmavathi

Checked by : Dr. A. Nagasathya

Semester	Co	de		Title of the Course				Hours		Credits	
IV	21UZ	008P	MAJOR	PRACTICAL BIOLOGY A	, IV: DEVEL ND EVOLUT	OPMENTAL 'ION		4	4		
Course	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
Outcomes (COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5	
C01	✓	✓	✓		✓	✓	✓	✓	✓	✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓		✓	✓		✓	✓		✓ 🗆		
CO4	✓	✓				✓	✓		✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of Ma	atches(√):	=43Relati	ionship :]	High							

Mapping 1 - 20 21 - 40 41 - 60 81 - 100 61 - 80 Matches 15-29 30-34 35-44 45-50 1-14 Relationship Very Poor Poor Moderate High Very High

Course code 21UZO09 CELL AND MOLECULAR BIOLOGY L					С				
Core/Elective/Suppo	ortive	CORE COURSE: IX	06		05				
Course Objectives:									
The main objectives	of this course a	re to:							
1. Understand the	he principles of	Compound Microscope and the structural and fu	nctional aspec	cts of cell	and				
plasma meml	orane.		-						
2. Learn the stru	acture and the ro	le of cell organelles.							
3. Understand t	he organization of	of nuclear components and characteristics of can	cer cells.						
4. gain knowled	lge about Humar	h Chromosomes.							
5. Understand t	5. Understand the Central Dogma of the Cell.								
Unit:1		Cell Biology		18 HO	URS				
1.1 Microscopy – C	ompound								
1.2 General Structur	re of Prokaryotic								
1.3 General structur	e of Eukaryotic	cells.							
1.4 Cell membrane	- structure and f	unction.							
Unit:2	Struct	ure and function of cell organelles		18 H	IOURS				
2.1 Mitochor	ndria		•						
2.2 Golgi bo	dies								
2.3 Endoplas	mic reticulum								
2.4 Ribosom	es								
2.5 Lyososon	nes								
2.6 Cytoplas	mic inclusions.								
Unit:3		Nucleus		18 HO	URS				
3.1 Chromosome	es - Giant chrom	osomes – Polytene and Lampbrush							
3.2 Chromosome	es cell cycles								
3.3 Characteristic	cs of cancer cells	5.							
Unit:4		Molecular Biology		18 HO	URS				
4.1 Human chror	nosome Karvotv	pe.	I						
4.2 Pedigree anal	lvsis.	F-,							
4.3 Chromosoma	l syndrome in m	an- Turner, Down and klinefelter syndrome.							
4.4 Inborn errors	of metabolism.								
4.5 Genes in pop	ulations - Hardy	– Weinberg Principle							
4.6 Factors affect	ting Hardy – We	inberg equilibrium.							
Unit:5		Nucleic acids		18HO	URS				
5.1 Structure of I	DNA								
5.2 DNA replicat	tion								
5.3 Transcription	- types of RNA								
5.4 Protein synth	esis - Genetic co	de - Translation.							
5.5 Gene Regula	tion- Lac-Operor	n model.	1	00 -					
For a stal C C	Total Lecture	hours		90 H	IOURS				
Expected Course Of	mplotion of the	oourse student will be able to:							
	inpletion of the			174					
I. Recall the prin	ciples of Micros	cope and structure of cell.							
2. Compare the s	tructure and the	role of cell organelles	- 11 -						
3. Analyze the or	ganization of nu	clear components and characteristics of cancer c	ens.	K4					

4.	Explain about Human Chromosomes and their Errors. K5								
5.	Compile the structure of Nucleic acids and process of Protein synthesis.	K6							
K1 -	K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create								
Text	book(s)								
1	Powar, C. B. (2014). Essentials of Cytology. Himalaya Publishing House.								
2	Kumar, H, D. (2001). Molecular Biology and Biotechnology, Vikas Publishing House, New	Delhi.							
3	Bernice Anantharaj, M., 1998. Sellial. Cresolite Publications.								
4	Bernice Anantharaj, M., 1998. Marabiyal. Cresolite Publications.								
Refe	rence Books								
1	De-Robertis, E. D. P. and E. M. F. De Roberties, (2005) Cell and Molecular Bio International Edition informed Hong Kong.	ology. 8 th Edn.							
2	Verma, P. S. and V. K. Agarwal, (2021) Cytology, S. Chand and Co.								
Relat	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]								
1	http://ppup.ac.in/								
2	https://www.uou.ac.in/								
Cour	se Designed By: Dr.A.MaryHelitha Checked by : Dr. A. Nagas	sathya							

Semester	Co	de	Title of the Course			Hours		Credits		
V	2102	ZO09	CEL	L AND MOL	ECULAR BI	OLOGY		6	5	
Course		Programn	ne Outcon	nes (POs)		Progr	amme Spe	cific Outco	mes (PSO	s)
Outcomes	D04	DOD	DOO	DO 4		DC04	DCOO	DCOO	DCOA	
(LUS)	P01	POZ	P03	P04	P05	PS01	PS02	P\$03	PS04	PS05
C01		✓	✓	✓	✓		✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓			✓	□✓	✓	✓		✓ 🗆	✓
CO4	✓	✓		✓	✓	✓	✓	✓	✓	 ✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	
Number of Ma	Number of Matches(1)=44 Relationshin · High									

Mapping 1 - 20 21 - 40 41 - 60 61 - 80 81 - 100 Matches 1-14 15-29 30-34 35-44 45-50 Relationship Very Poor High Poor Moderate Very High

Course code	21UZO10 GENETICS AND MICROBIOLOGY L P				С
Core/Elective/Supp	ortive	CORE COURSE: X	06		05
Course Objectives:					-
The main objectives	of this course a	are to:			
1. Understand t	he concepts of M	Iendelism and process of inheritance.			
2. Learn the Ge	ne interaction ar	d Gene Mutation.			
3. Study Recom	bination in Mich	roorganisms and Human Genetics.			
4. Understand t	he Basic techniq	ues and identification of microbes based on stall	ning procedui	e.	
J. Understand t	ne causes, symp	toms and prevention of selected interoblar diseas	es in man.		
Unit:1		Genetics		18 HC	OURS
1.1 A brief accou	unt of Mendelisn	n - Monohybrid and Dihybrid crosses.			
1.2 Linkage					
1.3 Crossing ove	er				
1.4 Multiple alle	les – Blood grou	ps and their inheritance.			
1.5 Sex determin	ation in Man.				
	1			10 110	
Unit:2		Gene Interaction		18 HC	JURS
2.1Non alleli	c interactions –	Complementary, supplementary, duplicate, Epita	asis and lethal	genes.	
2.2 Mutation	: Gene mutation	, Chromosomal aberrations,			
2.3 Aneuploi	dy and Euploidy	,			
-					
	1				
Unit:3		Microbial Genetics		18 HC	DURS
3.1 Recombi	nation in Bacteri	a- Transformation, Conjugation, Sexduction,	I		
3.2 Recombin	nation in bacteri	ophage –			
3.3 Transduc	tion, Lytic and is	sogenic cycles of bacteriophage.			
3.4 Human C	Benetics: Eugenio	cs – Euphenics – Euthenics			
Unit:4		Microbiology		18 HC	OURS
			•		
4.1 Nutritional classi	fication of bacter	ria,			
4.2 Gram staining – C	Gram positive an	d Gram negative,			
4.3 Bacterial culture	– Media prepara	tion,			
4.4 Growin Curve	dilution technic	us spread streak pour plate methods			
4.5 Isolation – Sellar	unution teening	ue – spreau, streak, pour plate methods.			
Unit:5				18 HOU	RS
		Microbial diseases in man			N O
Causes, Symptoms a	and Prevention				
5.1 Bacterial dise	eases - Tubercul	osis, Typhoid, Gonorrhoea.			
5.2 viral disease	s - AIDS, POIIOR	nyenus, Unicken pox, nepatitis A. Avcosis			
J.J Pungai uista	Total Lecture	hours		90 F	IOURS
			[701	
Expected Course Of	uicomes:				
On the successful co	ompletion of the	course, student will be able to:			

1.	Recall the concepts of Mendelism and process of inheritance.	K1							
2.	Analyze the interactions of the Gene and mutation.	K4							
3.	Appraise Recombination in Bacteria and Bacteriophage and Human Genetics.	K5							
4.	Explain the causes, symptoms and prevention of selected microbial diseases in man. K5								
5.	Elaborate the Basic techniques and identification of microbes based on staining procedure.	K6							
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create								
Textl	book(s)								
1	Verma, P. S. and Agarwal, V. K. (2018), Genetics. S. Chand and Co., New Delhi.								
2	D K Maheshwari and R C Dubey (2013), A Textbook Of Microbiology, Kindle publications	8.							
3	Vijayaraman, K. Manikilli, Chellammal (2000). Nunnuirial. & Noeithadaikapiyal. A con 2 nd Edn., Chimeeraa.	mplete book –							
4	Bernice Anantharaj, M., 1998. Marabiyal. Cresolite Publications								
Refe	rence Books								
1	Pelczar, M. J. and R. D. Reid, (2010) Microbiology. Tata Mc Graw Hill.								
2	Friefelder, D., 1997. Microbial genetics. Narosa Publishing, New Delhi.								
Relat	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]								
1	https://www.cliffsnotes.com/								
2	https://microbiologyinfo.com/								
Cour	rse Designed By: Dr.A.Nagasathya Checked by : Dr. A. Nagas	athya							

Course Designed By: Dr.A.Nagasathya

Semester	Co	de		Title of the Course			Hours		Credits	
v	2102	ZO10	GE	NETICS ANI) MICROBIO	DLOGY	6		5	
Course		Programn	ne Outcon	nes (POs)		Progr	amme Spe	cific Out	comes (PS	Os)
Outcomes (COs)	P01	P02	P03	P04	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
C01	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO2	✓	✓		✓	✓	✓	✓	✓	✓	✓
CO3	✓		✓	✓	□✓	✓	✓			✓
CO4		✓		✓	✓			✓	✓	✓
CO5		✓	✓	✓		✓		✓	√	✓
Number of Ma	Number of Matches(✓)=41 Relationship : High									

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	Course code 21UZO11 BIOTECHNOLOGY I		L	Р	С		
Core/Elective/Supp	ortive	CORE COURSE: XI	06		05		
Course Objectives:				•			
The main objectives1.Understand t2.Understand t3.Understand t4.Understand t5.Understand t	s of this course a he basic tools an he principle of b he various aspec he types and role he various aspec	tre to: d techniques of gene cloning. lotting techniques, PCR, Production of Monoclo ts of Industrial Biotechnology. e of Biofertilizer in Agricultural Biotechnology ts of Enzyme Biotechnology	nal antibodies	and Gene	3		
Unit:1		Biotechnology		18 HOUI	RS		
1.1 Scope and in1.2 Genetic Engi1.3 Tools of Gen1.4 Gene cloning1.5 Construction	nportance of Bio ineering aetic Engineering g- Isolation of de a of Genomic Lil	technology g - Enzymes – Vectors. sired DNA – Insertion of DNA into Vector praries.					
Unit:2		Molecular Probes		18 H	OURS		
2.1 Southern, No 2.2 Polymerase C 2.3 Immunotechi 2.4 Genetherapy	rthern and Weste Chain Reaction. 10logy – Monocl	ern Blotting, onal antibodies - Production and uses.					
Unit:3		Industrial Biotechnology		18 HO	URS		
3.1 Fermentation 3.2 Fermenter Co 3.3 process of Fe 3.4 Industrial Pro	- Types of ferm onstruction- Type ormentation – Up oduction of insul	entation- Solid state, Submerged and Semi solid es of Fermenters, stream and Downstream processes, in.	, , , , , , , , , , , , , , , , , , ,				
Unit:4		Agricultural Biotechnology		18 HO	URS		
4.1 Biofertilizers 4.2 Nitrogen Fiz 4.3 Biopesticide	s – Blue Green A kation- Symbiotics.	lgae, Rhizobium, Azolla, Anabena and Phospha c and Non-Symbiotic	te solubilizer.				
	1						
Unit:5		Enzyme Biotechnology		18 HO	URS		
5.1 Extraction of enz 5.2 Preparation of cr 5.3 Precipitation of H 5.4 Immobilization of	zymes ude enzymes Enzymes of Enzymes –Met	thods – Types and Uses.					
	Total Lecture	hours		90 H	IOURS		
Expected Course O	utcomes:		I				
On the successful co	ompletion of the	course, student will be able to:					
1. Recall the tech	nniques of gene of	cloning.		K1			
2. Compare the p	principles of diffe	erent Biotechnological techniques.		K2			
3. Apply the process of fermentation and production of Insulin. K3							

4.	Analyze the role of Biofertilizer and Biopesticides.	K4						
5.	Explain various aspects of Enzyme Biotechnology.	K5						
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Eva	luate; K6 – Create						
Text	book(s)							
1	Dubey.R.C. (2014), A text book of Biotechnology. S. Chand and	company. New Delhi.						
2	Vijayaraman, K., S. Chellammal and P. Manikili, 1998. Uyiriyathozhilnutpam, Chimeeraa, Trichy.							
Refe	rence Books							
1	Satyanarayana. U (2020) Biotechnology. Books and Allied Pvt l	td, Kolkata.						
2	Gupta, P. K.,(2010) Elements of Biotechnology, Rastogi Publica	tions, Meerut.						
Rela	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]							
1	https://www.brainkart.com/menu/biotechnology/							
Cour	rse Designed By: Dr.G.Sankar Check	ed by : Dr. A. Nagasathya						

Semester	Co	ode]	Title of the Course			Hours		Credits	
v	210	Z011		BIOTECHNOLOGY			6		5	
Course		Programn	ne Outcon	nes (POs)		Р	rogramme S	Specific O	utcomes (P	SOs)
Outcomes (COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01		✓	✓	✓	✓			✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓		✓	✓	✓ 🗆	✓	√	□✓	✓ 🗆	✓
CO4	✓	1	✓ □		✓	✓	✓	✓		✓
CO5		1	✓		✓			✓	✓	✓
Number of Ma	atches(√)	=40Relati	onshin · I	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Cours	e code	21UZO12P	MAJOR PRACTICAL V: CELL AND MOLECULAR BIOLOGY, GENETICS AND MICROBIOLOGY AND BIOTECHNOLOGY	L	Р	С				
Core	Elective/Suppo	ortive	CORE COURSE: XII		04	04				
Cour	Course Objectives:									
The r	nain objectives	of this course a	re to:							
1.	Understand t	he different aspe	cts of cell function.							
2.	Understand the	he basic concept	s of Genetics.							
3.	Understand v	arious technique	s in Microbiology.							
Cell I	Biology									
1.	Chironomus	Larva – Mountir	g of Polytene Chromosome.							
2.	Onion root ti	p – Squash prepa	aration of Mitosis.							
3.	Spotters: Cer	trifuge and Elec	trophoresis unit							
Gene	Depending of	ular Biology Mondalian trait	in mon							
1.	Drosophila –	Genetic imports	nce male and female identification							
3	Pedigree anal	lysis – Human k	arvotype.							
4	ABO Blood §	grouping and Rh	typing							
5.	Spotters: Stru	icture of DNA, 7	ypes of RNA-mRNA, rRNA and tRNA							
Micro	obiology and B	iotechnology								
1.	Smear Prepar	ration, fixing and	l staining of bacteria – Simple and Gram stainin	g.						
2.	Motility of ba	acterial cell – Ha	nging drop method.	1 .						
3.	Spotters A	on – Sterilization	procedures, Serial dilution technique, Spread plate	ate techniqu	e.					
4.	spotters – At	illociave, reul pi	ate, moculation loop, incubator, FCK, Blotting	1111 t ,						
		Total Lecture	hours		90	HOURS				
Expe	cted Course Ou	utcomes:								
On th	e successful co	mpletion of the	course, student will be able to:							
1.	Recall the con	cepts of Cell Bio	logy and Molecular Biology.		K1					
2.	Compare the d	lifferent aspects	n Genetics.		K2					
3.	Apply the proc	cedure for Micro	biological techniques.		K3					
4.	Apply knowled	dge on various in	astruments in Biotechnology.		K3					
5.	Compile vario	us technology in	Microbiology and Biotechnology		K6					
K1 -]	Remember; K2	2 - Understand;	K3 - Apply; K4 - Analyze; K5 - Evaluate; K6	– Create						
Refer	ence Books									
1	M.M. Trig	unayat & <u>Kritika</u>	Trigunayat, (2019) A Manual of Practical Zool	ogy, Scientif	fic Publish	ner				
Relat	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]									
1	https://ww	w.scientificpubo	nline.com/							
	I — *									
Cour	se Designed Bv	: Dr.S.Amudha	Checked by :	Dr. A. Nag	asathva					
			· · · · · · · · · · · · · · · · ·	8	- J					

Semester	Code		Title of the Course				Hours		Credits	
			MAJOR PRACTICAL V: CELL AND MOLECULAR							
			BIOLOGY, GENETICS AND MICROBIO		OLOGY AND					
V	21UZ012		BIOTECHNOLOGY				6		5	
Course		Progra	mme Outcomes (POs)			Progr	gramme Specific Outcomes (PSOs)			
Outcomes										
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01	✓	✓	✓	✓		✓	✓	\checkmark		
CO2	✓	✓	✓			✓	✓	✓		
CO3	✓	✓ □	✓	✓	□✓	✓	✓	\checkmark	✓□	✓
CO4	✓	✓	□✓		✓	✓	✓	√	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of Matches(\checkmark)=42Relationship : High										

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

		ENVIRONMENTAL BIOLOGY AND					
Course code	21UZO13	MANAGEMENT	L	Р	C		
Core/Elective/Supp	ortive	CORE COURSE: XIII	06	06			
Course Objectives:				1	I		
The main objectives	of this course a	re to:					
1. Understand t	he concepts of A	biotic factors.					
2. Understand t	he concepts of]	Biotic factors.					
3. Understand t	he Community a	nd Population Ecology.					
4. Learn thetype	es of Pollution.						
5. Understand t	he importance of	Solid waste Management and conservation of F	orest.				
Unit:1		Environmental Biology. 18 HOURS					
1.1 Abiotic Facto	ors – soil – textu	e.					
1.2 soil formatio	n,	-,					
1.3 Soil profile -	light - biologica	l effects.					
1.4 Temperature	- thermal stratif	ication and adaptations.					
Unit:2		Biotic factors		18 H	IOURS		
2.1 Animal relat	ionship – Symb	iosis – Commensalism – Mutualism – Antibios	sis – Parasi	tism – Pr	redation –		
Competition.							
2.2 Ecosystem –	Definition – Stru	cture Pond ecosystem – Primary production – S	econdary pi	oduction			
2.3 Food chain –	Food web – Tro	phic levels – Energy flow					
2.4 Ecological p	yramids.	1 1 1					
2.5 Biogeochemi	cal cycles: Nitro	gen and phosphorus.					
Unit:3		Community Ecology		18 H	IOURS		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt	nities – Characte tification ession- types and gy – Population th – Biotic poten	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re	one – Edge	18 H	IOURS		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt	nities – Characte tification ession- types and gy – Population th – Biotic poten	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re	one – Edge egulation.	18 H	IOURS		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4	nities – Characte tification ession- types and gy – Population th – Biotic poten	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution	one – Edge	18 H effect 18 H	IOURS		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of w	nities – Characte tification ession- types and gy – Population h – Biotic poten – Sources – Effe ton – Sources – Effe	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution Ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary tertiary treatment	one – Edge egulation. ce – Acid ra	18 H effect 18 H in – Smog	IOURS IOURS g.		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of wa	nities – Characte tification ession- types and gy – Population h – Biotic potent – Sources – Effe ton – Sources – H ater pollution – H	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution Ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment.	one – Edge egulation. ce – Acid ra	18 H effect 18 H in – Smog	IOURS IOURS g.		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of water Unit:5	nities – Characte tification ession- types and ogy – Population ch – Biotic poten – Sources – Effe ton – Sources – H ater pollution – H	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment. Solid waste management	one – Edge egulation. ce – Acid ra	18 H effect 18 H in – Smog 18 H 18 H H H	IOURS IOURS g.		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of water Unit:5 5.1 Discommunication	nities – Characte tification ession- types and gy – Population h – Biotic poten – Sources – Effe ton – Sources – H ater pollution – H	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment. Solid waste management	one – Edge egulation. ce – Acid ra	18 H effect 18 H in – Smog 18 H 18 H H H	IOURS IOURS g. IOURS		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of water Unit:5 5.1 Bioaccumula 5.2 Biomagnifica	nities – Characte tification ssion- types and gy – Population h – Biotic poten – Sources – Effe ton – Sources – F ater pollution – F	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment. Solid waste management	one – Edge egulation.	18 H effect 18 H in – Smog	IOURS IOURS g.		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of w Unit:5 5.1 Bioaccumula 5.2 Biomagnifica 5.3 Bioremediati	nities – Characte tification ession- types and gy – Population th – Biotic poten – Sources – Effe ton – Sources – H ater pollution – H ater pollution – H	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment. Solid waste management worms in bioremediation	one – Edge egulation.	18 H effect 18 18 H in – Smog 18 18 H	IOURS IOURS g. IOURS		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of wa Unit:5 5.1 Bioaccumula 5.2 Biomagnifica 5.3 Bioremediati 5.4 Conservation	nities – Characte tification ession- types and gy – Population h – Biotic potent – Sources – Effe ton – Sources – H ater pollution – H ater pollution – H	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment. Solid waste management worms in bioremediation	one – Edge egulation. ce – Acid ra	18 H effect 18 H in – Smog	IOURS IOURS g. IOURS		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of water Unit:5 5.1 Bioaccumula 5.2 Biomagnifica 5.3 Bioremediati 5.4 Conservation	nities – Characte tification ession- types and gy – Population h – Biotic potent – Sources – Effe ton – Sources – F ater pollution – F ater pollution – F ater pollution – F ater pollution – F tion- ation. on-Role of earth of forest.	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment. Solid waste management worms in bioremediation	one – Edge egulation. ce – Acid ra	18 H effect 18 H in – Smog			
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of w Unit:5 5.1 Bioaccumula 5.2 Biomagnifica 5.3 Bioremediati 5.4 Conservation	nities – Characte tification ession- types and gy – Population h – Biotic potent – Sources – Effe ton – Sources – F ater pollution – F ater pollution – F tion- ation. on-Role of earth of forest.	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment. Solid waste management worms in bioremediation hours	one – Edge	18 H effect 18 H in – Smog 18 H 18 H 90	IOURS IOURS g. IOURS OHOURS		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of w Unit:5 5.1 Bioaccumula 5.2 Biomagnifica 5.3 Bioremediati 5.4 Conservation Expected Course On On the mage for t	nities – Characte tification ssion- types and gy – Population h – Biotic potent – Sources – Effe ton – Sources – H ater pollution – H tion- ation. on-Role of earth of forest. Total Lecture utcomes:	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment. Solid waste management worms in bioremediation hours	one – Edge	18 H effect 18 H in – Smog 18 H 18 H 90	IOURS IOURS g. IOURS OHOURS		
Unit:3 3.1 Types of commu 3.2 Community Stra 3.3 Ecological Succe 3.4 Population Ecolo 3.5 Population growt Unit:4 4.1 Air pollution 4.2 Water polluti 4.3 Control of wa Unit:5 5.1 Bioaccumula 5.2 Biomagnifica 5.3 Bioremediati 5.4 Conservation Expected Course On On the successful co	nities – Characte tification ession- types and gy – Population h – Biotic potent – Sources – Effe tion – Sources – H ater pollution – H tion- ation. on-Role of earth of forest. Total Lecture utcomes: ompletion of the	Community Ecology ristics of community – Ecological Niche – Ecoto patterns. Density – Natality – Mortality – Age Pyramids tial and environmental resistance – Population re Pollution ects -Greenhouse effect, Ozone and its importance Effects Primary, secondary, tertiary treatment. Solid waste management worms in bioremediation hours course, student will be able to:	one – Edge + egulation.	18 H effect 18 H in – Smog 18 H 90	IOURS IOURS g. IOURS OHOURS		
2.	Compare the importance of Biotic factors.	K2					
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3.	Apply the various aspects of Community and Population Ecology.	K3					
4.	Analyze the types of Pollution.	K4					
5.	Adapt themselves with importance of Solid waste Management and conservation of Forest.	K5					
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create						
Text	book(s)						
1	Arumugam. N, Concept of Ecology. Saras Publications.						
2	Bernice Anantharaj, M., 1998. Sunilaiyial. Cresolite Publications.						
	·						
Refe	rence Books						
1	Odum, E. P. (1971) Fundamentals of Ecology. W. B. Saunders Company, Philadelphia						
2	Verma, P. S. and V. K. Agarwal, (2015) Principles of Ecology. S. Chand and Co., New Del	lhi.					
Relat	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]						
1	http://www.uilis.unsyiah.ac.id/						
2	https://www.hzu.edu.in/						
Cour	Course Designed By: Dr. A. Mary Helitha Checked by : Dr. A. Nagasathya						

Semester	Co	de		Title of	the Cours	se	Ho	Hours Credit				
VI	2102	2013	ENVIRON	ENVIRONMENTAL BIOLOGY AND MANAGEMENT 6						5		
Course		Programm	ne Outcon	nes (POs)		Progr	amme Spe	Specific Outcomes (PSOs)				
Outcomes (COs)	P01	P02	P03	P04	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
C01	✓		✓	✓	✓	✓	✓	✓	✓			
CO2	✓	✓	✓	✓	✓		✓	✓	✓	✓		
CO3	✓		✓			✓	✓	✓ 🗆	✓□			
CO4	✓	✓	□✓		✓	✓	1	✓	×			
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Number of Ma	tches(√)	=42 Relat	Number of Matches()=42 Relationship : High									

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21UZO14	IMMUNOLOGY	L	Р	C
Core/Elective/Suppo	ortive	CORE COURSE: XIV	06		05
Course Objectives:					
The main objectives1.Understand t2.Understand t3.Understand t4.Understand t5.Understand t	of this course a he about immund he concept of Ar he concepts of he concepts of H	re to: e system and Lymphoid organs. tigen and Antibodies. fimmune response. ypersensitivity reactions.			
Unit:1		Immune system		18 HOU	RS
1.1 Innate and ac1.2 Lymphoid or1.3 Secondary –1.4 Cells of Lyn	equired immunity gans – Primary- Spleen and Lyn nphoid lineage –	 Active and passive. Thymus and Bone Marrow ph Nodes. Lymphocytes and NK cells. 			
Unit:2		Antigens and Antibodies		18 HOU	RS
2.1 Types of 2.2 Propertie 2.3 Structure	Antigens s of Antigen, and function of	antibodies - immunoglobulin G			
Unit:3	Unit:3 Immune Response 18 HOUR				
3.1 Mechanism of Co3.2 Mechanism of H	ell mediated Imn umoral Immune	nune Response Response.			
Unit:4		Hypersensitivity reaction		18 HO	URS
4.1 Factors causing h4.2 Types of hyper set	ypersensitivity ensitivity – Type	I, II, III, IV and V hyper sensitivity reactions.			
Unit:5		Immune techniques		18 H	OURS
5.1 Principles of 5.2 VDRL Slide 5.3 Single and D 5.4 ELISA, 5.5 Radio Immu	Precipitation and Test, ouble Immunodi no Assay (RIA).	l Agglutination ffusion,			
	Total Lecture	hours		90 H	IOURS
Expected Course Or	utcomes:				
On the successful co	mpletion of the	course, student will be able to:			
1. Recall about in	nmune system a	nd Lymphoid organs.		K1	
2. Compare the p	properties of antig	gen, structure and functions of antibodies		K2	
3. Explain the me	echanism of imm	une response.		K3	
4. Analyze the in	nportance of Hyp	ersensitivity reactions.		K4	
5. Elaborate the	principles of pre	cipitation and agglutination.		K 5	
K1 - Remember; K2	2 - Understand;	K3 - Apply; K4 - Analyze; K5 - Evaluate; K	6 – Create		

Textboo	k(s)
1	Dulsy Fatima, I. and N. Arumugam, 1998. Immunology. Saras Publications.
2	Vijayaraman, K. Manikilli,Chellammal 2000. Nunnuirial. &Noeithadaikapiyal. A complete book – 2 nd Edn., Chimeeraa Publications.
Referen	ce Books
1	Kuby, J. (2013) Immunology, W. H. Freeman, Oxford.
2	Joshi, K. R. and N. O. Osama, (2002) Immunology. Agro Botanical Publishers India.
Related	Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	https://microbenotes.com/category/immunology/
	•
Course	Designed By: Dr.G.Sankar Checked by : Dr. A. Nagasathya

Semester	C	ode		Title of	the Cours	se	Но	urs	Cre	Credits	
VI	210	J ZO14		IMMU	INOLOGY			6	5		
Course		Program	ime Outco	mes (POs)		Progr	amme Spe	cific Outco	mes (PSO	Os)	
Outcomes											
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5	
C01	✓	✓	✓	✓	✓			✓	✓	✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓ 🗆	✓	✓		✓	✓	✓ 🗆	✓□	✓	
CO4	✓	✓	□✓		✓	✓	✓			✓	
CO5	✓	✓	✓	✓		✓	✓	✓	✓		
Number of Matc	hes(√):	=43Relati	onship :	High							

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code 21UZO15P		21UZO15P	MAJOR PRACTICAL VI: ENVIRONMENTAL BIOLOGY AND MANAGEMENT, IMMUNOLOGY, BIOPHYSICS, BIOSTATISTICS AND BIOINFORMATICS AND APPLIED	L	Р	С
			ENTOMOLOGY			
Core	Floctive/Supp	ortiva	COPE COURSE: XV		04	04
Cour	se Objectives:		CORE COURSE. AV		04	04
The	ngin objectives	s of this course s	re to:			
1	Understand t	he analysis of va	rious factors in the water samples			
2	Understand t	the significance of	f Immunology			
3	Understand y	various aspects in	Biophysics Biostatistics and Bioinformatics			
4	. Understand t	the various types	of pests.			
5	Understand t	the Animal assoc	iations and role of various instruments			
Envi	conmental Biol	ogv:				
1	. Estimation o	f Dissolved Oxy	gen			
2	. Estimation o	f Salinity				
3	. Estimation o	f Carbon di oxid	2			
4	. Estimation o	f Calcium hardne	ess			
5	. Mounting of	Marine Planktor	/Freshwater Plankton			
6	. Spotters:					
	Animal asso	ciation, Intertidal	fauna (Rocky,Sandy, Muddy shores – any 2 exa	amples in eac	ch catego	ry),
-	Secchi disc.					
Imm	unology					
D:1	ABO Blood	grouping	•			
вюрі	iysics and Blos	statistics and Bio	informatics:			
1	Boor lombor	t's Low vorificatio	n using colorimotor			
	Calculation of	f Mean Mode Me	dian Variance Standard Deviation and Standard err	or from leave	of plants	
3	Diagram cons	struction – Bar His	and standard Deviation and Standard encorrant	Ji nom leaves	s or plants.	
4	Spotters:	Judeuon Dai, m	kograni, i ie.			
	Photoelectric	colorimeter Spect	rophotometer Micrometer			
	Input devices:	Mouse Keyboard	Light Pen Scanner			
	Output devices.	Wonitor printo	, Light I ch, Seamer.			
		s. Montor, printer				
	Internet and it	s uses (Demonstra	tion).			
Annli	ied Entomolog	v – Spotters:				
· · PP		j sponers.				
	1. Pest of Cu	ltivated crops: P	addy, Vegetables: Brinjal, Bhendi, Trees: Cocon	ut		
	2. Insects of	stored products [any two]			
	3. Household	d pests [any two]				
	4. Disease ca	arrying vectors: H	Iouse fly and Mosquito.			
		Total Lecture	hours		90	HOURS
Expe	cted Course O	utcomes:		1		
On th	ne successful co	ompletion of the	course, student will be able to:			
1.	Recall various	parameters in th	e water samples.			K1
2.	Outline the sig	gnificance of Imr	nunology			K2
3.	Apply the pro	cedure for variou	s aspects in Biophysics, Biostatistics and Bioinfo	ormatics.		K3
4.	Analyze vario	us types of pests				K4
5.	Explain Anim	al associations a	nd role of various instruments.			K5
K1 -	Remember; K2	2 - Understand;	K3 - Apply; K4 - Analyze; K5 - Evaluate; K6	– Create		

Referen	nce Books	
1	M.M. Trigunayat & Kritika Trigunayat, (2019) A Manual of P	ractical Zoology, Scientific Publisher
Related	d Online Contents [MOOC, SWAYAM, NPTEL, Websites etc	.]
1	https://www.scientificpubonline.com/	
Course	e Designed By: Dr.A.Mary Helitha	Checked by : Dr. A. Nagasathya

Semester	Co	ode	Title of the Course			se	Hours		Cre	Credits		
VI	21UZ	:015P	MAJOI BIOLOG BI BIOINFOI	MAJOR PRACTICAL VI: ENVIRON BIOLOGY AND MANAGEMENT, IMM BIOPHYSICS, BIOSTATISTICS. BIOINFORMATICS AND APPLIED ENT				6		5		
Course		Program	ne Outcon	nes (POs)		Progr	amme Spe	cific Outco	mes (PSC	mes (PSOs)		
Outcomes												
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5		
C01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CO3	✓	□✓				✓	✓	✓ 🗆		✓		
CO4	✓	✓		✓	✓	✓	✓	✓	✓	✓		
CO5	✓	✓			✓		✓	✓		✓		
Number of Ma	tches(√)	=43 Relat	ionship :	High								

Number of Matches() To Relationship Fingh

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21UZO16	SERICULTURE	L	Р	С		
Core/Floative/Sunne	ntivo		06	-	05		
Course Objectives:	oruve	CORE COURSE: AVI	00		05		
The main objectives	of this course a	re to:					
1 Understand fl	he History and d	evelopment of Sericulture					
2. Study the cul	tivation, types, d	liseases and propagation methods of Mulberry.					
3. Learn the stru	ictural organizat	ion and rearing of Silkworm.					
4. Learn the pro	cedure for mour	ting of silkworm for spinning cocoons.					
5. Study the pro	cess of reeling o	f cocoons.					
Unit:1		Introduction		18 HO	URS		
		Introduction					
1.1 Scope of serie	culture						
1.2 History of Se	ericulture						
1.3 Development	of sericulture in	India and Economic importance.					
Unit:2		Mulberry cultivation		18 HO	URS		
2 1 Environment	l conditions for	cultivation – temperature humidity and light – r	reparation c	of land			
2.2 Mulberry vari	ieties in Tamilna	du	reputation	/i iulia.			
2.3 Methods of p	ropagation – irri	gation – manuring – application of fertilizers.					
2.4 Pruning – Mu	llching – Harves	ting of leaves – preservation of leaves					
2.5 Diseases and	pests of mulberr	у.					
Unit:3		Silk worm		18 HOURS			
3.1 Morphology of si	lkworm – larva a	and moth.					
3.2 Physiology of silk	c gland.						
3.3.Life cycle of <i>Bom</i>	ibyx mori						
3.4 Rearing house –	Rearing appliance	es – Rearing operation. Seed operation – hatchi	ng – brushn	ng – feed	ing – bed		
$\frac{1}{3}$ = \frac{1}{3} = $\frac{1}{3}$ = \frac{1}{3} = $\frac{1}{3}$ = \frac{1}{3} = $\frac{1}{3}$	ago gillavorm	Pooring of later stage of sillsworm					
5.5 Rearing of young	age sikwonn –	Rearing of fater stage of sitkworm.					
Unit•4		Harvesting		18	HOURS		
4.1 Mounting of	silkworm for sni	nning cocoons – methods of mounting		10			
4.1 Woulding of 4.2 Harvesting of	coccons – Oual	ity of cocoons					
4.3 Non mulberry	v silkworm – Tas	ar. Muga and Eri.					
4.4 Diseases of sil	kworm,						
4.5 Pests of silkw	vorm – Preventio	n and control measures.					
	1		T				
Unit:5	Unit:5 Reeling 18 HOUR						
5.1 Reeling of co	L COONS – process	of reeling					
5.2 Stifling and s	torage – Sorting	and deflossing.					
5.3 Reeling equipments.							
5.4 Utility of byproducts – mulberry plant, silkworm excreta, pupa and silk waste.							
	1 otal Lecture	HOUIS		90	HUUKS		
Expected Course Ou	itcomes:						
On the successful co	mpletion of the	course, student will be able to:					

1.	Recall the History and development of Sericulture.	K1					
2.	Outline the cultivation, types, diseases and propagation methods of Mulberry.	K2					
3.	Organize the structural organization and rearing of Silkworm.	K3					
4.	Examine the procedure for mounting of silkworm for spinning cocoons.	K4					
5.	Elaborate the process of reeling of cocoons.	K6					
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Creat	e					
Textl	pook(s)						
1	Ganga, G. and J. Sulochana Chetty, 1998. An introduction to sericulture. 2 nd Edn. Ox	ford and IBH.					
Refer	rence Books						
1	Ullal, S. R. and M. N. Narasimhanna, (1981). Hand book of practical sericulture Bombay.	e. Central Silk Board,					
Relat	ed Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]						
1	http://www.gdcboysang.ac.in/						
Cour	Course Designed By: Dr. A. Nagasathya Checked by : Dr. A. Nagasathya						

Semester	Со	de	-	Title of the Course		•	Hours		Credits	
VI	2102	ZO16		SERICULTURE			6		5	
Course		Programn	ne Outcom	nes (POs)		Pr	ogramme Spe	cific Outco	mes (PSO	s)
Outcomes (COs)	P01	PO2	PO3	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01	√	✓	✓	✓	✓	✓	✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	□✓	✓	✓	✓ 🗆	✓	✓	✓ 🗆		✓
CO4	✓	✓			✓		\checkmark	✓		
CO5	√	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of Ma	Number of Matches(√)=43 Relationship : High									

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21UZO17	ANIMAL BEHAVIOUR AND NEUROPHYSIOLOGY	L	Р		С
Core/Elective/Suppo	ortive	CORE COURSE: XVII	06			05
Course Objectives:						
The main objectives	of this course a	re to:				
1. Understand th	ne Ethology, clas	ssification of Behavioral pattern, analysis, reflect	tions and p	erceptio	on to tl	he
Environment						
2. Understand N	leural and hormo	onal control of behaviour, Genetic and environm	ental comp	ponents	in the	
development	of behaviour and	d Motivation.	1			
3. Understand	the Ecological a	spects of behaviour, Biological rhythms, Learnin	ng and men	nory.		
4. Know the dif	rerent types of R	eproductive benaviour and Social Benaviour.	ology			
5. Onderstand u	le mennoreguia	and a comparative study on Receptor physi	ology.			
Unit•1				18	HOI	
Cint.1		Introduction		10		
1.1 Introduction-	Ethology as a b	ranch of biology- Animal psychology,				
1.2 Classification	of behavioural	patterns, analysis of behaviour (ethogram) - Ref.	lexes and o	complex	k behav	viour.
1.3 Perception of	the environmen	t - mechanical, electrical, chemical, olfactory, a	uditory and	d visual		
Unit:2		Behaviour and Motivation			18 H	OURS
2.1 Neural and hormo	onal control of be	ehavior - Genetic and environmental components	s in the dev	velopme	ent of	
behaviour.						
2.2 Motivation: Drive	e, timing and inte	eraction of drives, physiological basis of motivat	ion, hormo	ones and	1 motiv	vation,
aggregation.	Chamical visual	light and audio evolution of language (primate	c)			
	chemical, visual	, light and addio, evolution of language (primate				
Unit•3		Ecological aspects of behavior		18	ноі	IRS
3 1 Habitat select	ion food selecti	on optimal foraging theory anti-predator defense	es aggres	sion	mot	
3.2 homing territo	oriality, dispersa	l. host parasite relations.	ics, aggres	51011,		
3.2 homing territoriality, dispersal, host parasite relations.						
3.3 Biological rhythms: Circadian and circannual rhythms, orientation and navigation, migration of fishes,						
3.3 Biological rh turtles and bir	ythms: Circadian rds.	n and circannual rhythms, orientation and naviga	tion, migra	ation of	fishes	,
3.3 Biological rh turtles and bi 3.4 Learning and	ythms: Circadian rds. I memory: Cond	n and circannual rhythms, orientation and naviga	tion, migra	ation of and rea	fishes	, 5.
3.3 Biological rh turtles and bi 3.4 Learning and	ythms: Circadian rds. I memory: Cond	n and circannual rhythms, orientation and naviga	tion, migra	ation of and rea	fishes soning	, 5.
3.3 Biological rh turtles and bi 3.4 Learning and Unit:4	ythms: Circadian rds. 1 memory: Cond	n and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour	tion, migra	ation of and rea 18	fishes soning	, <u>g.</u> U RS
3.3 Biological rh turtles and bi 3.4 Learning and Unit:4	ythms: Circadiar rds. 1 memory: Cond	n and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour	tion, migra	ation of and rea 18	fishes soning HOU	, g. U RS
 3.3 Biological rhy turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex and 	ythms: Circadian rds. I memory: Cond and reproductive	n and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se	tion, migra	ation of and rea 18 rental ca	fishes soning HOU are.	, g. U RS
 3.3 Biological rhy turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavior 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation	n and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding	tion, migra n learning lection, pa in mamma	ation of and rea 18 rental ca ils, grou	fishes soning HOU are. p selec	, g. U RS ction,
 3.3 Biological rh, turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavion kin selection, 4.2 Social behavion kin selection, 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro	n and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding bcal altruism, inclusive fitness.	tion, migra	ation of and rea 18 rental ca ls, grou	fishes soning HOU are. p selec	, <u>g.</u> U RS ction,
 3.3 Biological rhy turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavion kin selection, 4.3 Social organi 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects	n and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding ocal altruism, inclusive fitness. and primates.	tion, migra	ation of and rea 18 rental ca ls, grou	fishes soning HOU are. p selec	, g. U RS ction,
 3.3 Biological rh, turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavikin selection, 4.3 Social organi 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects	n and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding ocal altruism, inclusive fitness. and primates.	tion, migra	ation of and rea 18 rental ca lls, grou	fishes soning HOU are. p selec	, U RS ction,
 3.3 Biological rhy turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavion kin selection, 4.3 Social organi Unit:5 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding ocal altruism, inclusive fitness. and primates. Regulation	tion, migra	ation of and rea 18 rental ca ls, grou 18 I	fishes soning HOU are. p selec HOUR	, g. URS ction, RS
 3.3 Biological rhy turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavikin selection, 4.3 Social organi Unit:5 5.1 Thermoregular 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding ocal altruism, inclusive fitness. and primates. Regulation ermic animals, poikilotherms & Hibernation.	tion, migra	ation of and rea 18 rental ca lls, grou 18 H	fishes soning HOU are. p selec HOUR	, U RS ction, RS
 3.3 Biological rh, turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behaving kin selection, 4.3 Social organi Unit:5 5.1 Thermoregular 5.2 Receptor phy 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects ation: Homoeoth siology a compa	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding ocal altruism, inclusive fitness. and primates. Regulation mermic animals, poikilotherms & Hibernation. rative study – Mechano receptor, Photo receptor	tion, migra	ation of and rea 18 rental ca ls, grou 18 I ceptor (fishes soning HOU are. p selec HOUR	, <u>g.</u> URS ction, ction,
 3.3 Biological rhy turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavion kin selection, 4.3 Social organi Unit:5 5.1 Thermoregular 5.2 Receptor phy receptor, Equ 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects ation: Homoeoth siology a compa ilibrium recepto	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding ocal altruism, inclusive fitness. and primates. Regulation mermic animals, poikilotherms & Hibernation. rative study – Mechano receptor, Photo receptor r.	tion, migra	ation of and rea 18 rental ca ls, grou 18 H ceptor (fishes soning HOU are. p selec HOUR	, g. URS ction, RS
 3.3 Biological rh, turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavikin selection, 4.3 Social organi Unit:5 5.1 Thermoregular 5.2 Receptor phy receptor, Equ 5.3 Bioluminesce 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects ation: Homoeoth siology a compa ilibrium recepto ence	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding bcal altruism, inclusive fitness. and primates. Regulation termic animals, poikilotherms & Hibernation. rative study – Mechano receptor, Photo receptor r.	tion, migra	ation of and rea 18 rental ca lls, grou 18 H ceptor (fishes soning HOU are. p selec HOUR	, g. URS ction, RS
 3.3 Biological rh, turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behaving kin selection, 4.3 Social organi Unit:5 5.1 Thermoregular 5.2 Receptor phy receptor, Equipart 5.3 Bioluminesce 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects ation: Homoeoth siology a compa ilibrium recepto ence	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding ocal altruism, inclusive fitness. and primates. Regulation hermic animals, poikilotherms & Hibernation. rative study – Mechano receptor, Photo receptor r.	tion, migra	ation of and rea 18 rental ca ls, grou 18 I ceptor (fishes soning HOU are. p selec HOUR	, g. URS ction, RS
 3.3 Biological rhy turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavikin selection, 4.3 Social organi Unit:5 5.1 Thermoregular 5.2 Receptor phy receptor, Equ 5.3 Bioluminesce 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects ation: Homoeoth siology a compa ilibrium recepto ence	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding bocal altruism, inclusive fitness. and primates. Regulation termic animals, poikilotherms & Hibernation. rative study – Mechano receptor, Photo receptor r.	tion, migra	ation of and rea 18 rental ca lls, grou 18 H ceptor (fishes soning HOU are. p selec HOUR Chemo	, g. URS ction, Ction, S
 3.3 Biological rh, turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavion kin selection, 4.3 Social organi Unit:5 5.1 Thermoregular 5.2 Receptor phy receptor, Equ 5.3 Bioluminesce 	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects ation: Homoeoth siology a compa ilibrium recepto ence Total Lecture	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual set s, schooling in fishes, flocking in birds, herding bocal altruism, inclusive fitness. and primates. Regulation mermic animals, poikilotherms & Hibernation. rative study – Mechano receptor, Photo receptor r.	tion, migra	ation of and rea 18 rental ca ls, grou 18 I ceptor (fishes soning HOU are. p selec HOUR Chemo	, urs ction, rs ours
3.3 Biological rh turtles and bi 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavi kin selection, 4.3 Social organi Unit:5 5.1 Thermoregula 5.2 Receptor phy receptor, Equ 5.3 Bioluminesce Expected Course Ou	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro- zation in insects ation: Homoeoth siology a compa ilibrium recepto ence Total Lecture	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding bocal altruism, inclusive fitness. and primates. Regulation termic animals, poikilotherms & Hibernation. rative study – Mechano receptor, Photo receptor r. hours	tion, migra	ation of and rea 18 rental ca ls, grou 18 H ceptor (fishes soning HOU are. p selec HOUR Chemo	, g. URS ction, RS o OURS
3.3 Biological rh turtles and bin 3.4 Learning and Unit:4 4.1 Evolution of sex a 4.2 Social behavi kin selection, 4.3 Social organi Unit:5 5.1 Thermoregula 5.2 Receptor phy receptor, Equ 5.3 Bioluminesce Expected Course Ou On the successful co	ythms: Circadian rds. I memory: Cond and reproductive or - aggregation altruism, recipro zation in insects ation: Homoeoth siology a compa ilibrium recepto ence Total Lecture atcomes: mpletion of the	h and circannual rhythms, orientation and naviga itioning, habituation, insight learning, associatio Reproductive behaviour e strategies, mating systems, courtship, sexual se s, schooling in fishes, flocking in birds, herding bcal altruism, inclusive fitness. and primates. Regulation termic animals, poikilotherms & Hibernation. rative study – Mechano receptor, Photo receptor r. hours course, student will be able to:	tion, migra	ation of and rea 18 rental ca ls, grou 18 I ceptor (Fishes soning HOU are. p select HOUR Chemo	, g. URS ction, RS o OURS

	reflections and perception to the Environment.	
2.	Outline the Neural and hormonal control of behaviour, Genetic and environmental components in the development of behaviour and Motivation.	K2
3.	Identify various types of the Ecological aspects of behaviour, Biological rhythms, Learning and memory.	К3
4.	Analyze the different types of Reproductive behavior and Social Behaviour.	K4
5.	Explain different aspects of Thermoregulation and Receptor physiology.	K5
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create	
Refe	rence Books	
1	Kerbs, J.R. and N.B. Davies (2012), An Introduction to Behavioural Ecology. Blackwell, C	Dxford, U.K.
Relat	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://www.sparknotes.com/biology/animalbehavior/behavioralecology/summary/	
Cour	se Designed By: Dr. S.P.Jeyapriya Checked by : Dr. A. Naga	sathya

Semester	Co	de		Title of the Course			Hours		Credits	
VI	2102	Z017	ANIMAL	BEHAVIOUR	AND NEURO	PHYSIOLOGY		6	5	
Course		Programm	ne Outcon	nes (POs)		Progr	amme Spe	cific Outco	mes (PSC	Ds)
Outcomes (COs)	P01	P02	P03	P04	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
C01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	1	✓
CO3	✓		✓	✓		✓	✓			✓
CO4	✓	✓		✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓		✓	✓	✓	✓	
Number of Ma	Number of Matches(✓)=41 Relationship : High									

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21UZO18	HEALTH AND HYGIENE	L]	Р	С
Core/Elective/Suppo	ortive	CORE COURSE: XVIII	06			05
Course Objectives:						
The main objectives	of this course a	are to:				
1. Understand t	he classification	of foods and water standards				
2. Study the cor	nmunicable and	non-communicable diseases.				
3. Learn about t	he Arthropod di	seases				
4. Learn about (Jecupational Ha	zards th Education				
5. Study the Im	portance of Hear	in Education.				
Unit:1		Introduction			18 HO	URS
1.1.Scope of	health and hygid	ana				
1.1 Scope of 1.2 Classific	ation of foods					
1.3 Growth a	and development	. Environment and health.				
1.4 Water: W	/ater standards a	nd purification of water.				
Unit:2	Commun	icable diseases and non-communicable diseas	es		18 H	OURS
2.1 Respiratory	infections: Dip	htheria, Influenza, Tuberculosis.				
2.2 Intestinal in	ifections: Typho	bid, Ameobiosis.				
2.3 Coronary n	eart disease, Dia	ibetic mellitus.				
Unit:3		Infections			18 H	OURS
3.1 Platyheln	inthes infection	s – Liverfluke (<i>Fasciola hepatica</i>)			10 11	
3.2 Arthropo	d Borne infection	ns - Dengue, Zoonosis.				
L'Init:4				1	18 110	UDS
0111.4		Occupational health			10 110	UNS
4.1 Physical						
4.2 Mechanical						
4.3 Biological	l hazarda					
4.4 I Sychologica	i nazarus.					
Unit:5				1	18 HO	URS
		Health education				
5.1 Health plans	of India					
5.2 Role of Natio	onal and Internat	ional Organization (WHO) in the health care of	the comm	unity.		
	Total Lecture	hours			90 H	OURS
Expected Course Ou	itcomes:					
On the successful co	mpletion of the	course, student will be able to:				
1. Recall the clas	sification of foo	ds and water standards.			K1	
2. Outline the cau	uses of communi	cable and non-communicable diseases.			K2	
					17.0	
S. Identify the symptoms caused by the Arthropod diseases K3 4 Analysis the different types of Health Hegerds K4						
4. Analyse the di	Dens and import	Health Hazards.			K4 V6	
K1 - Remember - K2	2 - Understand	K3 - Annly: K4 - Analyze: K5 - Evaluate: K6	- Create	<u>,</u>	N0	
	onuci stanu,	in apply, in - analyze, in - Evaluate, Nu	- Ur calt	-		
Reference Books						
1 Park, J. E.	and K. Park, (20	15) Text book of preventive and Social Medicin	ne, 13 th Ed	ln. Ban	asidas I	3hanot,

	Jabalpur.							
-								
Related	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]							
1	https://www.jaypeebrothers.com/							
Course 2	Designed By: Dr.A.Nagasathya	Checked by : Dr. A. Nagasathya						

Semester	Co	de		Title of the Course			Hours		Credits	
VI	21U	ZO18]	HEALTH AND HYGIENI				6	5	
Course		Programm	e Outcom	es (POs)		Pro	gramme Sp	pecific Outcor	nes (PSO	s)
Outcomes										
(COs)	P01	PO2	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01		✓	✓	✓	✓		✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	~
CO3	✓			✓		✓	✓			✓
CO4	✓	✓			 ✓ 	✓	✓	1		~
CO5	✓	✓	✓	✓		✓	✓	✓	✓	
Number of Ma	tches(√)	=42 Relat	ionship :	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21UZOME1	APPLIED ENTOMOLOGY	L	Р	С
Core/Elective/Sup	portive	ELECTIVE COURSE : I	04		04
Course Objectives	:				÷
The main objective 1. Understand 2. Study abour 3. Learn the re 4. Learn abour 5. Study the in	es of this course a the Classification t the Harmful Inse ole of Beneficial In t the pests of Hous poortance of Pest	are to: of Insecta. cts. nsects. se Hold and Public Health. Management			
Unit:1		Introduction		18 HOU	RS
1. Classificatio	on of insects upto	orders and their diagnostic characters with famil	iar and imp	ortant exam	ples.
Unite?	1			18 10	
Umt:2	H	Iarmful insects: Classification of insect pests.		10 10	UKS
2.1 Insect pests	- Binomics , life	cycle, control measures			
2.2 Pests of Pac	ddy- Rice stem bo	rer, Brown plant hopper,			
2.3 Sugarcane -	– Shoot borer, Top	borer,			
2.4 Coconut – I	Rhinoceros beetle,	Leaf caterpillar			
2.5 Cotton – Ai	phids, Spotted Bol	lworm.			
2.6 Pests of ve	egetables- Brinial	- Fruit Borer (Leucinodesorbonalis). Bendi-	Fruit Bo	rer (<i>Earia</i>	sfabia).
Tomato-Fru	uit Borer (<i>Helicove</i>	erpaarmigera) and Potato Tuber moth(Phthorim	aeaopercul	ella).	5 / 2
Unit:3		Beneficial Insects		18 HOU	RS
3.1 Species, Binom	ics, Life cycle and	By products of Honeybee,	I		
3.2 Species, Binom	ics, Life cycle and	By products of Silkworm			
	les, Elle cycle and	By products of Eac insect.			
Unit:4	Ins	ect pests of house hold and stored products		18 HO	URS
4.1 Their biole americana), silv oryzae). 4.2 Insects in (cholore) Aven	ogy, mode of in ver fish (<i>Lepisma</i> relation to Public	festation, damage caused and control method saccharina), Red flour beetle (<i>Triboliumcastane</i> c Health - Biology, disease transmission and	ds of cock eum) & Rice control of	roach (<i>Peri</i> e weevil (<i>Sii</i> <i>Musca do</i>	iplaneta tophilus mestica
(cholera), Anop	netes stephensti(II	laiana), Culex quinquejuscialus(elephannasis) &	Aeues uegy	pii (deligue).
Unit:5	Pest Manage	ement		18 HOU	RS
5.1 Natural con 5.2 Chemical co 5.3 IPM.	trol and Artificial ontrol, Mechanica	control l Control and Biological control	I		
	Total Lecture h	ours		90 H	IOURS
Expected Course (Dutcomes:				
On the successful of	completion of the	course, student will be able to:			

1.	Recall the Classification of Insecta.	K1						
2.	Outline the different varieties of Harmful Insects.	K2						
3.	Summarize the role of Beneficial Insects.	K3						
4.	Explain the pests of House Hold and Public Health. K4							
5.	Elaborate the importance of Pest Management.	K5						
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create							
Text	book(s)							
1	Nalina Sundari. M.S. and Shanthi. R, (2006) Entomology MJP Publications							
2	VasantharajDavid.B.,(2016) Elements of Economic Entomology,Brillion Publications							
Refe	rence Books							
1	Modern Entomology, D. B. (2016) Tembhare, Himalaya Publishing House.							
2	David, B. V., N. C. Muralirangan and Meera Muralirangan, 1992. Harmful and beneficial i Book Depot.	nsects. Popular						
Relat	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]							
1	https://www.helpforag.app/2018/03/entomology-notes.html							
Cour	se Designed By: Dr.N.Padmavathi Checked by : Dr. A. Naga	sathya						

Semester	Co	de	Title of the Course			Hours		Credits		
V	21UZ	OME1		APPLIED E	NTOMOLO	GY	4			4
Course		Programn	ne Outcon	nes (POs)		Progr	amme Spe	cific Out	comes (P	SOs)
Outcomes (COs)	P01	PO2	PO3	P04	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
C01		✓	✓	✓	✓		✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO3	✓		✓	✓	✓□	✓	✓	✓□		✓
CO4	✓	✓	□✓		✓	✓	✓	✓		✓
C05	✓	✓	✓			✓	✓	✓	✓	✓
Number of Ma	utches(√)	=42Relati	onship : I	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course	e code	21UZOME2	BIOPHYSICS, BIOSTATISTICS AND APPLICATION OF COMPUTER IN BIOLOGY	L	Р	С		
Core/	Elective/Sup	portive	ELECTIVE COURSE: II	04		04		
Cours	se Objectives	Objectives:						
The n	nain objectiv	es of this course a	are to:					
1.	Understand	the Basic concept	ts in Biophysics					
2.	Study the d	ifferent methods f	or the collection and process of Data.					
3.	Learn the m	nethods of Measur	es of central tendency.					
4.	Learn the B	Basic aspects of Co	omputer in Biology.					
5.	Understand	the basic aspects	of Bioinformatics and internet Browsing.					
	Unit:1 Introduction 18 HOURS							
1.	1 Scope of Bi	iophysics						
1.	2 Laws of Th	ermodynamics.						
1.	3 Basic conce	ept of colloids – D	escription – Types,					
1.	4 Properties:	Electro kinetic pro	operties – Donnan's equilibrium, Tyndall effect	, Brownia	n moveme	ent, Surface		
	tension, Dif	ffusion and Osmos	sis.		10			
	Unit:2		Biostatistics		18	HOURS		
2.	1 Data Collec	tion: Primary and	secondary data.					
2.	2 Classification	on and tabulation.						
2.	3 Organizatio	n of data: Discrete	e and Continuous series.		_			
2.	4 Diagramma	atic presentation of	of data: Bar diagram, Pie diagram, Frequency	polygon, l	Frequency	curve and		
h1	stogram.				10 11	ound		
Unit:	3		Measures		18 H	OURS		
3.	1 Measures of	f central tendency	: Mean, Median, Mode					
3.	2 Measures of 2 Stendard D	t dispersion						
3. 2	3 Standard De	eviation and Stand	lard Error					
5.	<u>4 CO-efficient</u> Linit•4				18 H	OURS		
	0111.4		Application of Computer in Biology		10 11	OUND		
4.	1 Computer -	Basic Components	s of computers – Input and Output Devices,	I				
4.	2 CPU, Memo	ory and its types.						
	Unit:5		Bioinformatics		18 H	OURS		
5.	1 Basic ideas	about Internet Br	owsing	I				
5.	2 World wide	e web – Email	-					
5.	3 Bioinforma	tics						
5.	4 Biological	Data bases-DNA a	and Protein					
5.	5 NCBI,EME	BL and PDBI						
Total Lecture hours 9						90 HOURS		
Expec	cted Course (Dutcomes:						
On th	e successful o	completion of the	course, student will be able to:					
1.	Outline the F	Basic concepts in H	Biophysics.		K	2		
2. Summarize the different methods for the collection and process of Data. K3						3		
			1 					
3.	Recall the me	ethods of Average	e, Measures of dispersion.		K	1		
4.	Identify the b	basic components	ot Computer.			3		
5.	Analyze the	Biological data in	the Databases.	~~~~	K	4		
K1 - I	Kemember; k	12 - Understand;	K3 - Apply; K4 - Analyze; K5 - Evaluate; K6) – Create	9			

Textboo	k(s)
1	Ramakrishnan, P., 1996. Biostatitics. Saras Publications, Nagercoil.
2	Balagurusamy, E., 1984. Programming in Basic, Prentice Hall, New Delhi.
3	Vijayaraman, K., George John and P. Manikili. UyiriyaIyarpiyal, Uyiriyal, KaniniyinPayanpadugal, Uykiriyapulliyiyal .Chimeeraa Publications.
Referen	ce Books
1	Das, D., 1996. Biophysics and Biological Chemistry, Himalaya Publishing House.
2	Palanichamy, S. and M. Shanmugavelu. (1991) Principles of Biophysics. Paramount Publications.
3	Arora, P. N., (2009). Biostatistics. Himalaya Publishing House.
4	Rajaraman, V., (2003). Fundamentals of Computers, Prentice Hall of India.
Related	Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	https://www.tutorialsduniya.com/notes/biological-physics-notes/
2	https://old.amu.ac.in/emp/studym/99991854.pdf
3	https://www.uc.edu/webapps/af/hr/CUSTOMGUIDE/content/content/computerbasics.pdf
Course	Designed By: Dr.S.P.Jeyapriya Checked by : Dr. A. Nagasathya

Semester	Co	ode		Title of the Course			Hours		Credits		
			BIOPI APPLIC	BIOPHYSICS, BIOSTATISTICS AND APPLICATION OF COMPUTER SCIENCE							
VI	21UZ	OME2		IN BIC	DLOGY		4			4	
Course		Program	ne Outcon	nes (POs)		Pro	ogramme Spe	cific Out	comes (P	omes (PSOs)	
Outcomes (COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5	
C01	✓		✓	✓	✓	✓	√	✓	✓	✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓		✓	✓	□✓	✓	✓	□✓		✓	
C04	✓	✓	□✓						✓	✓	
CO5	✓		✓	✓	✓	✓	√	✓	✓	✓	
Number of Ma	tches(√)	=42 Relat	ionship :	High							

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21UZOME3	BIOINSTRUMENTATION	L	Р	С
Core/Elective/Su	pportive	ELECTIVE COURSE: III	04	04	
Course Objective	es:				
The main objecti	ves of this course a	are to:			
1. Understar	nd the principles and	d applications of Microscopy			
2. Understar	d the principles of	Centrifuge and pH meter.			
3. Understar	id the principles and	d applications of analytical techniques and Radio	pactive Isotop	es.	
4. Understar	id the principle and	types of Chromatography and Electrophoresis			
5. Understar	id the principles of	Biosensor and PCR.			
Unit.1				10	UOUDS
UIII.I		Microscope		10	HOUKS
1.1 Microscopy -	Principles				
1.2 Types - Light	- Compound,				
1.3 Phase contr	ast,				
1.4 Polarizing					
1.5 Electron.					
Unit:2		Analytical Techniques -I		18	HOURS
2.1 Centrifuge	e - Principles				
2.2 Types - C	linical, ultra-centrif	uges			
2.3 pH meter	- Sorenson's pH sca	ale,			
2.4 Principle a	and applications.				
Unit.2		Analytical Techniques II		10	HOUDS
2 1 Speetrose	ony Dringinla on	d application		10	ΠΟυκδ
3.1 Spectrosc	Principle and a pu	d application.			
3.3 Radio isotopic	technique-GM co	unter Scintillation counter			
Unit:4		Analytical Techniques -III		18 HO	URS
4.1 Chromato	graphy— principl	le			
4.2 Types and a	pplication - P	aper. Thin laver. Column.			
4.2 Electronhone					
4.5 Electrophores	sis – principie, Types	8			
4.4 Applicatio	on –AGE, PAGE				
				10	
Unit:5		Analytical Techniques -IV		18 HO	URS
5.1 Biosensor	s –Principle, Types	and application			
5.2 PCR–Prin	ciple, Types and a	pplication.			
	Total Lecture h	iours		90	HOURS
Expected Course	Outcomes:			20	110 0110
On the successful	completion of the	course, student will be able to:			
1.Relate the t	principle and applic	ations of various types of Microscopy.		K1	
	1 ····································	51 ·····			
2. Explain the	principles of Centr	fige and pH meter.		K2	
3. Apply varia	ous aspects of analy	tical techniques and Radioactive Isotopes		K3	
4. Categorize	the chromatography	y and Electrophoresis techniques for separation of	of Different	K4	

	samples.	
5.	Interpret the principles of Biosensor and PCR.	K5
K1 -	Remember; K2 - Understand; K3 - Apply; K	4 - Analyze; K5 - Evaluate; K6 – Create
Text	book(s)	
1	Veerakumari.,2006. Bioinstrumentation, M	IJP publications Chennai
Refe	rence Books	
1	M.A. Subramanian (2005), Biophysics (Pr	inciples and Techniques) MJP Publishers, Chennai
Rela	ted Online Contents [MOOC, SWAYAM, NP	TEL, Websites etc.]
1	http://unaab.edu.ng/	
Com	rea Dasignad By: Dr P Caatha	Checked by , Dr. A. Negosethya

Semester	Co	de		Title of	the Cours	se	Hou	irs	Cree	lits
VI	21UZ	OME3		BIOINSTR	UMENTATI	ON	6		5	
Course		Programn	ne Outcon	nes (POs)		Progr	amme Spe	cific Out	comes (PS	Os)
Outcomes										
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓		✓	✓	✓□	✓	✓	✓□	✓ 🗆	✓
CO4	✓	✓			✓	✓		✓		✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of Ma	atches(1)	=43 Relat	ionship :	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21UZOE4	HUMAN NUTRITION	L	Р	С				
Core/Elective/Suppo	ortive	ELECTIVE COURSE: IV	06		05				
Course Objectives:									
The main objectives	of this course a	re to:							
1. Understand t	he Food its types	and its Biological significance.							
2. Understand t	2. Understand the importance of vitamins, minerals and water.								
3. Understand	the calorific value	le of foods.							
4. Study the Nu	tritional requirer	000S.	ama durina pro	anonau					
5. Know the hu	and aged persons	inems of different age groups, food felated proble	enis during pre	gnancy,					
adorescence	and aged persons								
Unit:1		Introduction		18 HOU	RS				
1 Internation									
1. Introduction	and scope.	ida alagsification							
1.1 Carbonyurate	es,proteinsandip	ius-classification							
1.2 Sources- dig	ments_essentiala	non minoacids_essentialfatty acids							
	ments-essentiala	minoacids-essentialitatty acids.							
Unit:2		Nutrients		18 H	IOURS				
2. Vitamins-sou	urcesandfunction	s –deficiencystatus.							
2.1 Minerals-sou	urcesandfunction	s –deficiencystatus.							
2.2 Waterasanutr	rient-regulationo	fwaterbalance.							
	1								
Unit:3	C C 1	Energy Requirements		18 H	IOURS				
3.1 Calorific valu	ues of food								
3.2 Basal metabo	romonts of mon	woman infants and children							
3.5 Ellergy lequi	rements or man,	woman, mants and emdren.							
Unit:4		Nutritional value		18 HO	URS				
4.1Nutritional va	lue of foods:								
4.2 Cereals, frui	ts, milk, egg	, meat, fish.							
4.3 Balanced die	et.								
				10 77 0					
Unit:5		Nutritional requirements		18 HO	URS				
5.1 Infante scho	olchildren		<u> </u>						
5.2 pregnant and	lactating mother	s and the aged							
5.3 Health educa	tion	s und the uged							
5.4 Malnutrition									
	Total Lecture	hours		90 H	IOURS				
Expected Course Or	utcomes:		I						
On the successful co	mpletion of the	course, student will be able to:							
1. Recall the Foo	d its types and it	s Biological significance.		K1					
2. Outline the im	portance of vitar	nins, minerals and water.		K2					
3. Estimate the ca	alorific value of	foods.		K3					
4. Evaluate the n	utritive value of	different food products and food processing.		K4					
5. Assess the nut	tritional requiren	nents of different age groups, food related proble	ems during	K5					
pregnancy, add	plescence and ag	ed persons.	-						
K1 - Remember; K2	2 - Understand;	<u>K3 - Apply; K4 - Analyze; K5 - Evaluate; K6</u>	6 – Create						

Refer	rence Books						
1 Mudambi,S.R.(2012)Fundamentals of Food and nutrition. New age International, NewDelhi							
Relat	ed Online Contents [MOOC, SWAYAM, NPTEL,	Websites etc.]					
1	https://www.britannica.com/science/human-nutri	tion					
Cour	se Designed By: Dr.S.P.Jeyapriya	Checked by : Dr. A. Nagasathya					

Semester	Со	de	,	Title of the Course			Hours		Credits		
VI	21UZ	OME4		HUMAN NUTRITION			4		4		
Course		Programn	ne Outcon	nes (POs)		Pr	Programme Specific Outcomes (PSOs)				
Outcomes											
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5	
C01		✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO2	✓		✓	✓	✓	✓		✓	✓	✓	
CO3	√	□✓		✓	□✓	✓	✓		\checkmark	✓	
CO4	✓	✓	✓□	✓	✓	✓	✓	✓	✓	✓	
CO5	\checkmark	✓	✓		✓	✓	✓	✓			
Number of Ma	tches(√):	=42 Relat	ionship :	High							

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Cours	se code	21UZOME5	FISH PROCESSING TECHNOLOGY	L	Р	С	
Core	/Elective/Sup	portive	ELECTIVE COURSE: V	04		04	
Cour	se Objectives	:			•		
Cour The 1 1 2 3 4 5 1.1 N 1.2 G 1.3 S	se Objectives main objectives understand Study the ro Learn the pr Learn the pr Unit:1 Unit:1	es of this course the concepts of l le of Fish Micro rocedure for free rocedure for free rocess of Cannin of fish protein ers of fish fat, at different stag	e are to: Fish Biochemistry biology. n fish handling and preservation. zing of fishes. g of fishes. Fish Biochemistry es.		18 HOU	JRS	
Unit		18 H	IOURS				
2.1 N 2.2 N	licrobial spoila licrobial flora	age of fish in various types	of semi-processed and processed fishery pr	roducts.			
Unit	3	Fre	esh fish handling and preservation		18 H	IOURS	
3.1 N 3.2 F	lechanism of s ish analysis–b	poilage acterial &chemi	cal reactions-use of ice and salt-use of ant	ibiotics &c	chemicals		
Unit	4		Freezing of fishes		18 HOURS		
4.1 D 4.2 N	ifferent techni utritional char	ques–physico-ch iges during freez	nemical changes ing				
	T T 1 / P	I		10			
	Unit:5		Canning of fishes	18	SHOURS		
5.1 P 5.2 P 5.3 S	rinciples of car reservation, ad moking of fish	nning ditives and pick hot&cold smol	le salting– salting of fish sundrying–bacter king–smoking methods– fishery by produc	iology of s ts	alted fish		
		Total Lecture	hours		90 H	IOURS	
Expe	cted Course (Dutcomes:					
On t	he successful o	completion of th	e course, student will be able to:				
1.Recall the concepts of Fish Biochemistry.K1							
2.	Outlinethe role	e of Fish Microbic	logy.		K2		
3.	Apply the proc	edure for fresh fis	h handling and preservation.		K3		
4.	Analyzethe pro	ocedure for freezin	ng of fishes.		K4		
5.	Elaborate the	process of Cann	ing of fishes.		K5		
K1 -	Remember; k	K2 - Understand	l; K3 - Apply; K4 - Analyze; K5 - Evalua	ate; K6 – (Create		

Textboo	Textbook(s)								
1	Govindan, T.K., 1992. Fishprocessing technology, Oxofrd&IBH.								
Referen	nce Books								
1	Santhanam, R1987. Fisheries Science, Daya Publishing House.								
Related	d Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]								
1	http://niftem-t.ac.in/olapp/pmfme/upload/mt_handbook_fish.pdf								
Course	Course Designed By: Dr.G.Sankar Checked by : Dr. A. Nagasathya								

Semester	Co	Code Title of the Cours			e Course		Hours		Credits	
VI	21UZ	OME5	FISH PROCESSING TECHNOL			LOGY	2	1	4	
Course		Programm	ne Outcomes (POs)			Pro	Programme Specific Outcomes (PSOs)			
Outcomes										
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01	✓		✓	✓		✓	\checkmark	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	□✓	✓	✓	✓□	✓	✓	✓□	✓□	
CO4	✓			✓	✓		✓	√	✓	✓
CO5			✓	✓				1	✓	✓
Number of Ma	tches(√)	=40 Relati	ionship :	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21UZOME6	WILD LIFE CONSERVATION	L		Р	С
Core/Elective/Sup	portive	ELECTIVE COURSE: VII	06	5		05
Course Objectives	:		<u>I</u>	l		
The main objective	es of this cours	se are to:				
1. Understand the	he basic concept	s in Wild Life Conservation.				
2. Study the org	anization and W	ild life Legislation.				
3. Learn the Ma	inagement plann	ing for Wild life conservation.				
4. Learn the abo	but caring and co	ontrolling diseases of Wild life.				
5. Study about t	ne different type	s of which he reserves.				
Unit:1		Wild life		1	8 HO	URS
1.1 Values of w	ild life - positiv	ve and negative.				
1.2 Our conserv strategies.	ation ethics, In	portance of conservation, Causes of depletion	on, Wor	ld con	iserva	tion
1.3 Habitat anal	ysis, Evaluatio	n and management of wild life.				
1.4 Physical par	ameters - Topo	graphy, Geology, Soil and water.				
1.5 Biological	Parameters - fo	od, cover, forage, browse and coverestimation	on.			
1.6 Standard ev	aluation proced	lures - remote sensing and GIS-Managemen	t of habi	itats.		
	I		r			
Unit:2		Population estimation			18	HOURS
2.1 Population dens	ity, Natality, B	irth rate, Mortality, fertility schedules and se	ex ratio	compu	itatior	1.
2.2 National Organ	ization,Indian	board of wild life.Bombay Natural History S	bociety,	Volun	tary	
organization inv	volved in wild l	ife conservation.				
2.3 Wild life Legisl	ation – Wild Pi	cotection act -1972 , its amendments and imposed to the second	plement	ation.		
Unit.2	Mana	compart planning of wild life in protected are			10	HOUDS
3 1 Estimation (f carrying can	beity	as.		10	ΠΟΟΚΟ
3.2 Eco tourism	n carrying capa	rism in forests				
<u>5.2 Leo tourisir</u>		nsin in forests.				
Unit:4	Mana	pement of excess population & translocation			18 H	OURS
4.1 Bio- telemet	rv	Soment of encess population of transformation	<u> </u>		10 11	0010
4.2 Care of inju	red and disease	d animal.				
4.3 Ouarantine.						
4.4 Common di	seases of wild a	animal.				
Unit:5	Protected area	as National parks & sanctuaries, Community	7	18	8 HO	URS
	reserve.					
5 1 Important fe	atures of prote	cted areas in India				
5.2 Tiger conser	rvation - Tiger	reserve in M P in India Management challer	nges in '	Tiger 1	reserv	e
	Total Lectur	e hours		115011	90	<u>UNRS</u>
Exported Course (Jutaamagi				20	
On the successful	completion of	the course student will be able to.				
		Wild Life Concernation			17.1	
1. Kecall the bas	sic concepts in	wild Life Conservation.				
2. Outline the di	illerent organiz	ation and which the Legislation.			K2	
3. Apply the Management planning for Wild life conservation.K3						

4.	Analyzethe procedures for controlling diseases of Wild life.	K4							
5.	Explain the different types of Wild life reserves.	K5							
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate	e; K6 – Create							
Refe	erence Books								
1	Gopal Rajesh, Fundamentals of wild life management (2021) Natraj Publishers.								
	·								
Rela	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]								
1	http://animalrange.montana.edu/documents/extension/thebasicsofwildl	ifemgmt.pdf							
	· · ·								
Cou	rse Designed By: Dr.S.P.Jeyapriya	Checked by : Dr. A.							
Naga	Nagasathya								

Semester	Co	ode	Title of the Course			Hours		Credits		
VI	21UZ	OME6	WILD LIFE CONSERVAT			ION	2	1	4	
Course		Programn	ne Outcon	e Outcomes (POs) Pr			gramme Specific Outcomes (PSOs)			
Outcomes										
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓			✓	✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓		✓	✓		✓	✓			✓
CO4	✓	✓	□✓			✓	✓	✓		
C05	✓	1	✓	✓		✓	✓	✓	✓	✓
Number of Me	tab a a (./)	-41 Dalat	ionchin .	Hah						

Number of Matches(✓)=41 Relationship : High

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Cou	ırse code	21UAZ1	BIOLOGY OF INVERTEBRATA AND CHORDATA	L	Р	C	
Core/	Elective/Sup	portive/Allied	ALLIED COURSE: I	06		05	
Cours	se Objectives	•		l			
The m 1. 2. 3. 4. 5.	nain objective Understand Learn the Ge Learn the Ge Understand Study the cla Invertebrata	es of this cours the General character eneral character the General character assification, cha and Chordata.	aracteristics of Protozoa, Porifera and Coelenterateristics of Platyhelminthes, Aschelminthes and Ameristics of Platyhelminthes, Mollusca and Echinodermateristics of Pisces, Amphibia, Reptiles, Aves a aracteristics and analyze the structural organization	es. nelida. a. und Mami on ofselec	nals ted spe	ecies in	
1	Unit:1		Protozoa, Porifera and Coelenterates.	18	HOU	RS	
1.1 Ge 1.2 Ty	eneral character pe study - Para	rs of the phyla – amecium, Obelia	Protozoa, Porifera andCoelenterata. a.				
Unit:2		Р	latyhelminthes, Aschelminthes, Annelida		18 H	IOURS	
2.1Ger 2.2 Tyj	neral characters pe study - <i>Fasc</i>	s of the phyla- Pl ciola hepatica,Ea	atyhelminthes ,Aschelminthes, Annelida . arthworm				
Unit:3	•	A	Arthropoda Mollusca and Echinodermata		18 H	IOURS	
3.1 Ge 3.2 Tyj	eneral character pe study - Cocl	rs of the phyla- A kroach and <i>Pila</i> .	Arthropoda Mollusca and Echinodermata.				
Unit:4			Pisces, Amphibia and Reptilia	-	18 HO	URS	
4.1 Ge 4.2 Ty	neral character pe study-Shark	s of the classes- [Excluding endo	Pisces,Amphibia and Reptilia. skeleton],Frog[Excluding endoskeleton]				
	Unit:5		Aves and Mammalia		18 H	OURS	
5.4	4 General chara Type study-I	acters of the class Pigeon [excludin	ses -Aves and Mammalia g endoskeleton]				
		Total Lecture	hours		90 H	IOURS	
Expect	ted Course Ou	itcomes:		•			
On the	e successful co	mpletion of the	course, student will be able to:		IZ1		
1.	I. Recall the characteristics of Protozoa, Porifera and Coelenterata. K1						
2.	Outline the Ge	neral characteris	tics of Platyhelminthes, Ashelminthes and Annelida.		K2		
3.	Identify the Ge	eneral characteris	stics of Arthropoda, Mollusca and Echinodermata.		K3		
4. 5.	Categorize the Compare and c ofselected spec	General character contrast he classicies in Invertebra	eristics of Pisces, Amphibia, Reptiles, Aves and Mami fication, characteristics and analyze the structural org- ta and Chordata.	mals anization	K4 K5		

K1 - Rei	K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create						
Textboo	k (s)						
1	Nair N.C.and Arumugam.N. (2020) Text book of Invertebrates. Saras publications.						
2	Thangamani, T. and N. Arumugam. ((2019) Text book of Chordates. Saras publications.						
Referen	ce Books						
1	E.L.Jordan and P.S.Verma, (2009) Invertebrate Zoology, S.Chand publications						
2	E.L.Jordan and P.S.Verma, (2013) Chordate Zoology, S.Chand publications						
Related	Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]						
1	https://www.britannica.com/animal/invertebrate						
2	https://opentextbc.ca/biology2eopenstax/chapter/chordates/						
Course	Designed By: Dr.P.Kalyani Checked by : Dr. A. Nagasathya						

Semester	Co	de	Title of the Course			Hours		Credits			
ш	210	JAZ1	BIO	BIOLOGY OF INVERTEBRATA AND CHORDATA				1	4		
Course		Programm	ne Outcon	e Outcomes (POs) Progra				amme Specific Outcomes (PSOs)			
Outcomes (COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5	
C01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	
CO3	✓	□✓		✓	□✓	✓	✓			✓	
CO4	✓		□✓		✓	✓	✓	✓		✓	
CO5	✓	✓	✓	✓		✓	✓	✓	✓		
Number of Ma	tches(√)	=43Relati	onship : 1	High							

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code	21UAZ2	COMMERCIAL ZOOLOGY	L	Р	С
Core/Elective/Sup	portive/Allied	ALLIED COURSE: II	06		05
Course Objectives	:				
 The main objectiv 1. Understand 2. Learn the va 3. Learn the m 4. Study about 5. Study about 	es of this cours the Rearing pro- arious aspects in ethodology for the formation of the formation of	se are to: Decedure for Bee keeping In Sericulture maintaining farms for Pearl Oyster culture of Poultry farming. of Diary farming.	and Lac cul	ture.	
Unit:1		Apiculture		18 HC	URS
 1.1 Honey bee – Ty 1.2 Apiary Equipm 1.3 Diseases of Hon 1.4 Enemies and pr 1.5 Uses of Honey. 	pes, Life histor ent, Honey extr ney Bees, edators of Hone	ry, Bee Hive, Honey production, raction, Extraction of Beeswax, ey Bees,			
Unit:2		Sericulture		18	HOURS
2.1 Types – Mulber	rry and NonMu	lberry Silk Worm,	I		
2.2 life history of <i>B</i>	ombyx mori				
2.3 Silk glands, Use	es of Silk.				
2.4 Rearing of Silk	worm,				
2.5 Diseases and pe	ests.				
Unit.3	D	orl Ovstor Culture and Lac culture		18	HOURS
2 1 Piology of Poor	1 Ovetor	carroyster culture and Lac culture		10	HOURS
3.1 Diology of Tearls	i Oyster,				
3.2 Types of Tearls	, s - Culture met	hods Formation of Pearls			
3.4 Lac insect - life	cycle and cultu	re			
3.5 Predators and p	arasites of Lac.	,			
Unit:4		Poultry Farming		18 H	IOURS
4.1 Types of Po	oultry – Poultry	Housing			
4.2 Poultry Nu	trition				
4.3 Rearing of I	Layers and Broi	ilers			
4.4 Diseases a	nd their preven	tion – Ranikhet, Fowl pox, Coccidiosis			
4.5 Poultry Proc	ducts.				
TT 1/ F	1			101	IOUDO
Unit:5		Dairy Farming		181	HOURS
5.1 Cattles-Gir,	Sindhi,Jersey,N	Iurrah and Buffaloes.			
5.2 Managemer	nt of cow-Dairy	house			
5.3 Diseases-M	astitis,Rinder p	est,Foot and Mouth disease			
5.4 Nutritive va	lue of milk				
5.5 Pasteurizati	on-Dairy produ	cts and byproducts			
	Total Lectur	e hours		90	HOURS

Expe	Expected Course Outcomes:							
On t	On the successful completion of the course, student will be able to:							
1.	Recall the types, culturing equipment and uses of Honey Bee.	K1						
2.	Outline the types, cultivation procedure and the methods for rearing of Silkworm.	K2						
3.	Identify the cultivation methods for Pearl Oyster and Lac culture.	K3						
4.	Compare the classification, characteristics and methods for Poultry farming.	K4						
5.	Explain the classification, characteristics and methods for Dairy farming.	K5						
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Cr	eate						
Text	book(s)							
1	Arumugam.N and Murugan.T Applied Zoology (2015)Saras Publication							
Refe	rence Books							
1	Sukla,G.S.andUpadhyay,V.B.(2000)EconomicZoologyRastogiPublications,Meer	rut,India.						
Rela	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]							
1	https://onlinecourses.swayam2.ac.in/cec20_ge23							
Cou	rse Designed By: Dr.K.Radhika Checked by : Dr. A.	Nagasathya						

Semester	Co	de		Title of the Course H			Ho	urs	Cre	Credits	
IV	210	AZ2		COMMERC	IAL ZOOLO	GY	4	ł	4		
Course		Programn	ne Outcon	nes (POs)		Progr	Programme Specific Outcomes (PSOs)				
Outcomes											
(COs)	P01	P02	P03	P04	P05	PS01	PSO2	PSO3	PSO4	PSO5	
C01		✓	✓	✓	✓	 ✓ 	✓	✓	✓	✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓			✓		✓	✓			✓	
CO4	✓	✓			✓	✓	✓	✓		✓	
CO5	✓	✓	✓	✓		✓	✓	✓	✓		
Number of Ma	Number of Matches(✓)=42Relationship : High										

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course code 21UAZ3P PRACTICAL ZOOLOGY L P					Р	C		
Core	/Elective/Sup	portive/Allied	ALLIED COURSE:III	06		05		
Cour	Course Objectives:							
The	The main objectives of this course are to:							
1	. Enhance the	ir practical orie	ented subject knowledge					
	Dissect Alin	ody setae of Ea	Arterial system and Brain of the specimens be	longing to I	nvertehr	ata and		
5	Chordata.	lientary canar, i	internal system and fram of the specificity of			itu ullu		
4	. Apply know	ledge of classi	fication in the identification of specimens an	nd economic	e importa	ance of		
	its products.							
5	• Enhance goo	od drawing and	writing skills based on the identification of s	specimens.				
Disse	ections							
	Cockroach	· Alin	pentary canal					
	F							
	Frog	: Arte	rial system [Virtual]					
Mou	ntings							
	Earthworm	: Bod	v setae					
		. 200						
	Cockroach	: Mou	th Parts					
	Frog	: Brai	n[Virtual]					
Spot	ters							
	Specimens	Paramecium	Plasmodium Obelia Fasciola Ascaris Ne	ereis Cockre	oach Pe	pnaeus		
Dila	Storfish Shorl	r Erog Calota	Bigoon Dabhit		<i>ouon, 1</i> c	nacus,		
<i>г ша</i> ,	Starrish, Sharr	, Flog, Calole	s, Figeon, Rabon.					
Prod	ucts							
	Honey, bee	s wax, lac, silk	, wool, cod liver oil, pearl, poultry product (E	Egg).				
Econ	omic importa	nce						
	Honey bee	Housefly M	osquito Cockroach Bambyr mari Coco	on Pearl o	vster T	ermite		
Silvo	rfish Orvetas	rhinocaros	osquito, cockrouch, bombyx mort, coco		yster, r	crime,		
Silve	111511, OT yetes 1	ninoceros.						
		Total Lectur	e hours		90 H	OURS		
Expe	ected Course (Dutcomes:						
On t	he successful o	completion of	the course, student will be able to:					
1.	Recall the pra	ctical knowled	ge of various specimens		K1			
2.	Outline the st	ructural organi	zation of mouth parts in Cockroach.		K2			
3.	Identify and r	nount the body	setae of Earthworm and mouth parts of Cocl	kroach.	K3			

4.	Dissect the parts of Arterial System and Brain of given specimens.	K4					
5.	Adapt neat drawing and writing skills						
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate	e; K6 – Create					
Refe	rence Books						
1	P.S. Verma,(2007), A Manual of Practical Zoology Chordates, S. Chand	d publications					
2	P.S. Verma (2010) A Manual Of Practical Zoology: Invertebrates, Kindl	e edition					
Rela	ted Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]						
1	https://core.ac.uk/download/pdf/11017224.pdf						
2	https://www.mlsu.ac.in/econtents/						
Cou	rse Designed By: Dr.K.Radhika Checked	by : Dr. A. Nagasathya					

Semester	Co	de		Title of the Course			Hours		Credits	
IV	21U/	AZ3P		PRACTICAL ZOOLOGY			4	1	4	
Course		Programn	ne Outcon	e Outcomes (POs) Progra			amme Specific Outcomes (PSOs)			
Outcomes										
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01		✓	✓	✓	✓		✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	√	✓	✓	✓	✓
CO3	✓		✓	✓		✓	✓			✓
CO4	✓	✓			✓	✓	✓	✓		✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	
Number of Ma	Number of Matches(√)=42Relationship : High									

Number of Matches(✓)=42Relationship : High

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Cours	e code	21UZONME1	AQUACULTURE	L	Р	С			
Core	/Elective/Sup	portive	NONMAJOR ELECTIVE COURSE: I	02		02			
Cour	se Objectives	:			•				
The I	nain objectiv	es of this course a	ire to:						
1.	Understand	the selection criter	ria for Aquafarming.						
2.	Learn the cu	lture of different	ishes.						
3.	3. Learn the methodology for maintaining Shirmp farming.								
4.	4. Study about the Offiamental fish culture								
5.	Unit:1				18 HOU	RS			
	Chilli		Introduction		10 1100				
1.1 S	cope – Aquacu	Ilture farm– Site s	election						
1.2 D	esign and cons	struction – pond p	reparation.						
1.3 H	ydrological pa	rameters of farm	management.		40.77				
Unit:	$\frac{2}{1}$	•	Culture techniques		18 H	OURS			
2.1 C	ulture of Indian	major carps							
Unit:	3	aicarijer.	Shrimp Farming		18 H	OURS			
315	hrimp farming	Hatchery technic	nies			0010			
3.2 F	eed manageme	ent. live feed. farm	ing techniques.						
		.,							
Unit:	4		Culture of ornamental fishes		18 HOU	RS			
4.1 A	quarium – des	ign and constructi	on						
4.2 T	ypes of aquari	um fishes – egglay	vers-Goldfish, Angelfish, Fighterfish and	Gourami					
4.3Li	ve bearers –M	olly, Platy, Guppy	and Sword tail						
	Unit:5		Marketing		18H(OURS			
5.1 H	arvesting and	Preservation		I					
5.2 M	Iarketability ar	nd Economics Rol	e of MPEDA.						
		Total Lecture h	ours		90 H	OURS			
Expe	cted Course (Dutcomes:							
On tl	ne successful o	completion of the	course, student will be able to:						
1.	Recall the sel	ection procedure f	or Aquafarming.		K1				
2.	Outline the cu	alture of different	fishes.		K2				
3.	Identify the n	nethodology for m	aintaining Shirmp farming.		K3				
4.	4. Construct the methodology for the Ornamental fish culture. K4								
5.	5. Explain the harvesting and marketing technology K5								
K1 -	K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create								
Text	book(s)								
1	Arumugar	n.N. (2019) Aqua	culture Saras Publication.						

Reference Books						
1	Jhingran, V. G., 1997. Fish and fisheries of India. Hindustan Publishing Co., New Delhi.					
Related	Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]					
1	https://www.fao.org					
Course	Course Designed By: Dr.G.SankarChecked by : Dr. A. Nagasathya					

Semester	Co	Code		Title of the Course			Hours		Credits	
IV	21UZC	ONME1		AQUA	CULTURE		4	ŀ		4
Course		Programn	ne Outcon	e Outcomes (POs) Prog			amme Specific Outcomes (PSOs)			
Outcomes										
(COs)	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01	✓	✓	✓			✓	✓	✓		
CO2	✓	✓	✓	✓	✓	√	✓	✓	✓	✓
CO3	✓	□✓	✓	✓		✓	✓	□✓		✓
CO4	✓	✓				✓	✓	✓		
C05	✓	✓	✓	✓		✓	1	✓	✓	✓
Number of Ma	tches(√)	=41 Relat	ionship :	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Course coue	21UZONME2	VERMICULTURE	L	Р	C
Core/Elective/Sup	portive	NON MAJOR ELECTIVE COURSE: II	02		02
Course Objectives					
 The main objectiv 1. Understand 2. Learn the cu 3. Study the te 4. Learn the M 5. Study the Principal Study Study	es of this course a the Ecological and ulture and producti cchniques of Vermi lethods and Manag roduction and mar	are to: d Geographical distribution of Earthworm ivity of Earthworms. iculture. gement of Vermicomposting. keting technology	s.		
Unit:1 Introduction 18					
1.1 Scope and impo 1.2 Ecological class 1.3 Humus feeders	ortance of Vermite sification of Earthy and Humus farmer	chnology worms – epigeic, anecic and endogeic forn rs- Litter, top soil and sub soil types.	ns		
Unit.?		Soilrodomation		19 1	
2.1 Physical, chemi	ical and biological	changes brought by earthworm in soil		101	100K5
2.2 Vermiwash – ea	arthworm casts.				
Unit:3		Vermiculture technology		18 I	HOURS
	in vermeundure iv	connique			
3.2 Required condr 3.3 Predators & foc 3.4 Economic impo	tions for Vermicul od preference ortance of Earthwo	ture –oxygen, temperature, moisture, pH, rm.	salinity	and sunligh	t.
3.2 Required condi 3.3 Predators & foc 3.4 Economic impo	tions for Vermicul od preference ortance of Earthwo	ture –oxygen, temperature, moisture, pH, rm.	salinity	and sunligh	t.
3.2 Required condi 3.3 Predators & foc 3.4 Economic impo Unit:4	tions for Vermicul od preference ortance of Earthwo v	ture –oxygen, temperature, moisture, pH, rm. Termicomposting	salinity	and sunligh	t. J RS
 3.2 Required conditional and the second se	tions for Vermicul od preference ortance of Earthwo variable variable variable in Vermicomposting struction Vermicomposting stem.	ture –oxygen, temperature, moisture, pH, rm. /ermicomposting ng - Pit method,Heap method, Bin metho	salinity	and sunligh 18 HOU	t. J RS nod and
3.2 Required condi 3.3 Predators & foc 3.4 Economic impo Unit:4 4.1 Steps involved 4.2 Vermibed cons 4.3 Methods of V continuous flow system Unit:5	tions for Vermicul od preference ortance of Earthwo variable variable variable in Vermicomposting struction Vermicomposting stem.	ture –oxygen, temperature, moisture, pH, rm. remicomposting ng - Pit method,Heap method, Bin metho Production	od, Win	and sunligh	t. J RS nod and HOURS
3.2 Required condi 3.3 Predators & foc 3.4 Economic impo Unit:4 4.1 Steps involved 4.2 Vermibed cons 4.3 Methods of V continuous flow system Unit:5 5.1 In door and Lar	tions for Vermicul od preference ortance of Earthwo vermicomposting struction Vermicomposting stem.	ture –oxygen, temperature, moisture, pH, rm. //ermicomposting ng - Pit method,Heap method, Bin metho ////////////////////////////////////	od, Win	and sunligh	t. J RS nod and HOURS
3.2 Required condit 3.3 Predators & foc 3.4 Economic imposed Unit:4 4.1 Steps involved 4.2 Vermibed consection 4.3 Methods of Vermited Unit:5 5.1 In door and Lar 5.2 Role of Vermited	tions for Vermicul od preference ortance of Earthwo variable variable variable in Vermicomposting struction Vermicomposting stem.	ture –oxygen, temperature, moisture, pH, rm. fermicomposting ng - Pit method,Heap method, Bin metho Production n of Vermicompost te Management and agriculture.	od, Win	and sunligh	t. J RS nod and HOURS
3.2 Required condi 3.3 Predators & foc 3.4 Economic impo Unit:4 4.1 Steps involved 4.2 Vermibed cons 4.3 Methods of V continuous flow system Unit:5 5.1 In door and Lar 5.2 Role of Vermite	tions for Vermicul od preference ortance of Earthwo vermicomposting struction Vermicomposting stem. ge scale productio echnology in Wast Total Lecture h	ture –oxygen, temperature, moisture, pH, rm. remicomposting ng - Pit method,Heap method, Bin metho Production n of Vermicompost te Management and agriculture. ours	od, Win	and sunligh 18 HOU ndrow meth 18 I 90 I	t. JRS nod and HOURS HOURS
3.2 Required condi 3.3 Predators & foc 3.4 Economic impo Unit:4 4.1 Steps involved 4.2 Vermibed cons 4.3 Methods of V continuous flow sys Unit:5 5.1 In door and Lar 5.2 Role of Vermite Expected Course	tions for Vermicul od preference ortance of Earthwo vermicomposting struction Vermicomposting stem. ge scale productio echnology in Wast Total Lecture h Outcomes:	ture –oxygen, temperature, moisture, pH, rm. fermicomposting ng - Pit method,Heap method, Bin metho Production n of Vermicompost te Management and agriculture. ours	salinity	and sunligh	t. JRS nod and HOURS HOURS
3.2 Required condit 3.3 Predators & foc 3.4 Economic imposed Unit:4 4.1 Steps involved 4.2 Vermibed consection 4.3 Methods of Vermited Unit:5 5.1 In door and Lar 5.2 Role of Vermited Expected Course Course Consection On the successful of the successful	tions for Vermicul of preference ortance of Earthwo V in Vermicomposting struction Vermicomposting stem. ge scale productio echnology in Wast Total Lecture h Outcomes: completion of the	ture –oxygen, temperature, moisture, pH, rm. fermicomposting ng - Pit method,Heap method, Bin metho Production n of Vermicompost e Management and agriculture. ours course, student will be able to:	salinity	and sunligh 18 HOU ndrow meth 18 I 90 I	t. JRS nod and HOURS HOURS
3.2 Required condit 3.3 Predators & foc 3.4 Economic imposed 4.1 Steps involved 4.2 Vermibed consect 4.3 Methods of Vermited 5.1 In door and Lar 5.2 Role of Vermited Expected Course C	tions for Vermicul od preference ortance of Earthwo volume volume volume in Vermicomposting struction Vermicomposting stem. vermicom	ture –oxygen, temperature, moisture, pH, rm. fermicomposting ng - Pit method,Heap method, Bin metho Production n of Vermicompost te Management and agriculture. ours course, student will be able to: decographical distribution of Earthworms.	salinity	and sunligh 18 HOU 18 HOU 18 I 90 I K1	t. JRS nod and HOURS HOURS
3.2 Required condit 3.3 Predators & foc 3.4 Economic imposed 4.1 Steps involved 4.2 Vermibed consect 4.3 Methods of Vermited 5.1 In door and Lar 5.2 Role of Vermited Expected Course Course Con the successful of 1. Recall the the formation of the successful of the successful of the formation of t	tions for Vermicul od preference ortance of Earthwo vermicomposting struction Vermicomposting stem. ge scale productio echnology in Wast Total Lecture h Outcomes: completion of the <u>e Ecological and G</u> methods for produc	ture –oxygen, temperature, moisture, pH, rm. fermicomposting ng - Pit method,Heap method, Bin methol Production n of Vermicompost e Management and agriculture. ours fecourse, student will be able to: deographical distribution of Earthworms. ction of Earthworm.	salinity	and sunligh	t. JRS nod and HOURS HOURS
3.2 Required condition 3.3 Predators & foc 3.4 Economic imposition Unit:4 4.1 Steps involved 4.2 Vermibed constant 4.3 Methods of Vermibed constant 5.1 In door and Lar 5.2 Role of Vermited Expected Course On the successful of 1. Recall the the successful of 1. 3. Summarize the successful of 1.	tions for Vermicul of preference ortance of Earthwo variance of Earthwo variation vermicomposting stem. vermic	ture –oxygen, temperature, moisture, pH, rm. fermicomposting ng - Pit method,Heap method, Bin metho Production n of Vermicompost e Management and agriculture. ours course, student will be able to: decographical distribution of Earthworms. ction of Earthworm.	salinity	and sunligh 18 HOU 18 HOU 18 I 90 H 90 H K1 K2 K3	t. JRS nod and HOURS HOURS
3.2 Required condition 3.3 Predators & foc 3.4 Economic imposition Unit:4 4.1 Steps involved 4.2 Vermibed consist 4.3 Methods of Vermited Unit:5 5.1 In door and Lar 5.2 Role of Vermited Expected Course On the successful of 1. Recall the the 2. Outline the r 3. Summarize the	tions for Vermicul od preference ortance of Earthwo vortance of Ea	ture –oxygen, temperature, moisture, pH, rm. fermicomposting ng - Pit method,Heap method, Bin metho Production n of Vermicompost e Management and agriculture. ours course, student will be able to: deographical distribution of Earthworms. ction of Earthworm. ortance of Earthworm.	salinity	and sunligh 18 HOU 18 HOU 18 I 90 I 90 I K1 K2 K3 K4	t. JRS nod and HOURS HOURS
3.2 Required condition 3.3 Predators & foc 3.4 Economic imposition Unit:4 4.1 Steps involved 4.2 Vermibed consist 4.3 Methods of Vermibed consist 4.3 Methods of Vermibed consist 5.1 In door and Lar 5.2 Role of Vermited Expected Course On the successful of 1. Recall the the successful of 1. Quiline the r 3. Summarize the successful of 1. 4. Compare and 1. 5. Analyzethe r	tions for Vermicul of preference ortance of Earthwo variance of Earthwo variance of Earthwo variance of Earthwo variance of Earthwo variance of Earthwo variance of Vermitechn variance of Vermitechn variance of Vermitechn	ture –oxygen, temperature, moisture, pH, rm. fermicomposting ng - Pit method,Heap method, Bin metho Production n of Vermicompost e Management and agriculture. ours cours course, student will be able to: deographical distribution of Earthworms. ction of Earthworm. prance of Earthworm. prent methods in Vermicomposting. pology in different fields.	salinity	and sunligh 18 HOU ndrow meth 18 I 90 H 80 H <td>t. JRS nod and HOURS HOURS</td>	t. JRS nod and HOURS HOURS

Textb	ook(s)
1	Seetha lekshmy.M and Shanthi.R 2017 Vermitechnology Saras Publications
Refer	ence Books
1	Edwards, C. A. and P. J. Bohlen, 1996. Ecology of Earthworms, 3 rd Edn. Chapneau and
	Hall.
Relat	ed Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	https://everyething.com/vermitechnology
Cours	be Designed By: Dr.A.Maryhelitha Checked by : Dr. A.
Nagas	athya

Semester	Co	de	Title of the Course			Hours		Credits		
IV	21UZ(ONME2		VERM	CULTURE		4	4	4	
Course		Programn	ne Outcon	nes (POs)		Progr	amme Specific Outcomes (PSOs)			
Outcomes (COs)	P01	P02	P03	P04	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
C01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓		✓	✓	✓	✓		✓	✓	✓
CO3	✓			✓		✓	✓			~
CO4	✓	✓		✓	~	~	✓	✓	✓	~
CO5	✓	✓	✓		~	✓	✓	✓	1	
Number of Ma	tches(√)	=44Relati	onship : l	High						

Mapping	1 -20	21 - 40	41 - 60	61 - 80	81 - 100
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Cours	ourse code		PATHOLOGY AND CLINICAL LABORATORY – I	L	Р	С		
Core	/Elective/	Supportive	Skilled Enhanced courses I	06		05		
Cour	se Object	ives:		I				
The I	main obje	ctives of this cours	se are to:					
1.	. Underst	and basic concepts	of laboratory requirements.					
2.	2. Understand the principles of laboratory instruments.							
3.	3. Learn the procedure for the preparation of reagents							
4	. Learn th	ne methodology for	the collection and analysis of Blood					
5.	Underst	and modern laborat	ory instruments.					
U	nit:1	Or	ganization of clinical laboratory		18 HO	URS		
	1.1 \$	Safety measures - Cl	nemical, fire and Electrical					
	1.2 (Glassware –Descrip	ion of Glassware, its use, handling and care.					
	1.3	Lab Technician Dut	es and Responsibilities					
TT	1.4	Professionalism and	Ethics in laboratory workers		10			
Unit	2 2 1 1	icht Microscope	Instrumentation		18	HOUKS		
	2.11	Ight Microscope	wan Autoclava					
	2.21	aminar Air flow Cl	namber Water Bath					
	2.31	Centrifuge Microtor	neHaemocytometer Haemoglobinometer					
Unit	3	enunuge, mereter	Solvents		18	HOURS		
31 B	uffer and r	Н			20			
3.2 M	lolar soluti	ons - Physiological	saline. Turkey's fluid. Havem's fluid					
3.3 U	se of chem	icals and their intera	actions, danger signs, production techniques, a	nd disposal	methods	•		
Unit:	:4		Collection of blood		18 HO	URS		
4.1 A	nticoagula	ants - Separation of	Serum and Plasma					
4.2 B	lood cell c	count and differenti	al count					
4.3 E	stimation	of Haemoglobin (S	ahlis Method)					
4.4 C	lotting tim	e -bleeding time	,					
4.5 E	SR	-						
4.6 B	lood smea	r and for observation	on parasites.					
U	nit:5		Analyzing Techniques		18 H	OURS		
5.1 Se	emi and Fl	uid Auto Analyzer						
5.2 E	LISA							
5.3 P	CR							
5.4 H	aemotolog	yAnalyser	_ ·					
5.5 H	PLC Analy	ysis for Haemoglobi	n Fraction		0.0	HOUDG		
		Total Lecture ho	urs		90	HOURS		
Expe	cted Cour	rse Outcomes:						
On the second se	he success	ful completion of	the course, student will be able to:					
1.	Recall the	e basic concepts of	laboratory requirements.		K1			
2.	Outline the	he principles of lab	pratory instruments.		K2			
3.	Explain t	he procedure for th	e preparation of reagents		К3			
4.	Categorize the methodology for the collection and analysis of Blood K4							

5.	Compile the modern the laboratory techniques and instruments. K5					
K1 -	K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create					
Refe	Reference Books					
1	Mukherjee KL. (2010). Medical Laboratory Technology. Volume 1, 2 and 3. Tata McGraw-Hill					
	Education, India.					
Rela	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]					
1	1 https://apps.who.int/iris/bitstream/handle/10665/42295/9241545305.pdf					
Cour	rse Designed By: Dr.S.Amudha Checked by : Dr. A.	Nagasathya				

Course code 21UZOSEC2		PATHOLOGY AND CLINICAL LABORATORY – II	L	Р	С		
Core/Elective/S	upportive	Skilled Enhanced courses I	06		05		
Course Objectiv	ves:						
The main objec	tives of this cours	se are to:					
1. Understand basic concepts of various analysis							
2. Understa	nd the procedure f	for urine analysis					
3. Learn the	e Basic concepts o	f Microbiology					
4. Learn the	e methodology of I	Microtomy					
5. Understa	nd screening of B	lood samples.					
Unit:1		Analysis		18 HO	URS		
1. R	enal function tests,						
1.1 I	liver function tests						
Unit:2		Urine analysis		18	HOURS		
2. 1 U	Jrine: Collection ar	id preservation					
2.2 C	omposition – volur	ne – appearance and odors - Specific gravity -	Microscop	oic examin	nation.		
2.3 M	leasurement of glue	cose and protein.					
2.4 Fe	ecal examination: N	Aicroscopic – Occult blood					
2.5 H	elminthes Parasites	s. Semen analysis: count andmotility.					
Unit:3		Microbial analysis		18	HOURS		
3.1 Wet Preparati	ons of microbes						
3.2 Staining prep	arations: Simple &	Gram staining methods					
3.3 Antibiotic sus	sceptibility testing.						
Unit:4		Microtome analysis		18 HO	URS		
4.1 Microtome: F	Fixating – dehydrat	ion – clearing – infiltration – embedding	I				
4.2 Block prepara	ation – Sectioning –	Mounting – Staining.					
4.3 Biopsy for ca	ncer.						

1	Unit:5	Screening analysis	18HOURS				
5	.1 Screening	g of donor compatibility testing, safety, procurement of supplies.					
5	.2 Screening	donor's blood for infectious agents -HIV, HCV, HBV, Trepanoma pall	ladium, Plasmodium				
5	.3 ABO – R	th blood groups					
		Total Lecture hours	90 HOURS				
Expe	ected Cours	e Outcomes:					
On t	he successf	ul completion of the course, student will be able to:					
1.	Recall the	basic concepts of renal and liver function tests	K1				
2.	Outline the	e procedure for urine analysis	K2				
3.	Apply the	procedure for the Microbiological techniques.	K3				
4.	Analyze th	e methodology for Microtomy techniques.	K4				
5.	Explain th	ne pathogens in the Blood samples.	K5				
K1 -	Remember	; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6	6 – Create				
Refe	rence Book	S					
1	Mukhe	rjee KL. (2010). Medical Laboratory Technology. Volume 1, 2 and 3.	. Tata McGraw-Hill				
	Educat	ion, India.					
Rela	ted Online	Contents [MOOC, SWAYAM, NPTEL, Websites etc.]					
1	https://	apps.who.int/iris/bitstream/handle/10665/42295/9241545305.pdf					
Cou	Course Designed By: Dr.A.Nagasathya Checked by : Dr. A.						
Naga	Nagasathya						