

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE (AUTONOMOUS)-POLLACHI

347	B. Sc. Zoology	Ancillary Zoology Paper-II Economic Zoology	21UBY2A2	2021
348	B. Sc. Zoology	Non Major Elective (NME) : Ornamental Fish Culture	21UZY3N2	2021
349	B. Sc. Zoology	Biochemistry	21UZY510	2021
350	B. Sc. Zoology	Core Major Paper -X Ecology and Evolution	21UZY612	2021
351	B. Sc. Zoology	Core Major Paper-XI Microbiology and Immunology	21UZY613	2021
352	B. Sc. Zoology	Core Elective Paper-III Wild life Conservation	21UZY6E32	2021
353	B. Sc. Zoology	Core elective Paper VI- Dairy farming and management Technology	21UZY6E33	2021
354	B. Sc. Zoology	Core Elective Paper I Haematology and Clinical Pathology	21UZY5E3	2021
355	B. Sc. Zoology	Advanced Learner Course-I Bioinformatics	21UZY5AL1	2021
356	B. Sc. Zoology	Parasitology	21UZY6E6	2021
357	B. Sc. Zoology	Advanced learner course-II Immunotherapeutics	21UZY6AL2	2021
358	M.Sc. Mathematics	Core XVII: Algebraic Topology	21PMS417	2021
359	M.Sc. Mathematics	Major Elective I: Special Functions	21PM1E2	2021
360	M.Sc. Mathematics	Major Elective III: Mathematical Modelling	21PMS3E2	2021
361	M.Sc. Mathematics	Advanced Learner Course: Algebraic Number Theory	21PMS3AL	2021
362	M.Sc. Mathematics	Certificate Course: Data Analytics With Python	21PMS3CC	2021
363	M.Sc. Mathematics	Major Elective V:Fuzzy Logic and Fuzzy Sets	21PMS4E2	2021
364	M.Com	Business Environment	21PCO102	2021
365	M.Com	International Marketing	21PCO3E22	2021
366	M.Com	Direct Taxes	21PCO310	2021
367	M.Com	Financial Modeling	21PCO311	2021
368	M.Com	Industry 4.0	21PCO415	2021
369	M.Com	Advertisement and salesmanship	21PCO4E32	2021
370	Tamil Aided	Tamil Paper I	21UTL101	2021
371	Tamil Aided	Tamil Paper II	21UTL202	2021
372	B.A Tamil	Ikkala illakiyam	21UTM101	2021

BoS Minutes
Highlighted



New Course Introduced

Dr. R. MUTHUKOMARAN,
M.A., M.Phil., B.Ed., Ph.D.,
PRINCIPAL
N.G.M. College, Pollachi - 642 001
Coimbatore District

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DEPARTMENT ZOOLOGY

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE

POLLACHI - 642001

36th Board of Studies Meeting in the Department of Zoology –Online mode

22-05-2021& Time: 10.00 am

Agenda

BoS / ZOO 36.1	:	Welcome address and Opening Remarks by Chairman, Board of studies in the DEPARTMENT ZOOLOGY
BoS / ZOO 36.2	:	Confirmation of the Minutes of the 35 th / Previous meeting of Board of studies in the zoology department held on 22-02-2020 and Action taken report of 11 th meeting of Board of studies
BoS / ZOO 36.3	:	36.3.1 Syllabus of I, II, III BSc Zoology under Regulation 2021
BoS / ZOO 36.4	:	Suggestion given by BOS Members
BoS / DC 36.5	:	Any other items

11 – Number of BOS Meeting

BoS/ZOO 36.1 WELCOME ADDRESS AND OPENING REMARKS BY CHAIRMAN, BOARD OF STUDIES IN THE DEPARTMENT ZOOLOGY

The Chairman, BoS of the Department Zoology welcomed and introduced the members of 36th Board of Studies and thanked each one of them for sparing their valuable time to attend the meeting.

BoS/ZOO 36.2 TO CONFIRM THE MINUTES OF 35th BOS MEETING HELD ON 22-02-2020. The minutes of the 35th Board of Studies meeting held on 22-02-2020 were communicated to the members. The comments received have been incorporated and placed for confirmation. The same was approved by the PREVIOUS ACADEMIC MEETING NO.10 Academic council.

BoS/ ZOO 36.3

The panel members gave the following suggestions and recommendations were shown in the table (**Percentage of Revision of B. Sc Zoology Syllabus under Regulation 2021**). The presented syllabus was accepted by the experts.

The members had a brainstorming discussion and interaction among themselves. After discussion, fruitful suggestions were incorporated appropriately in the Curriculum and Syllabi.

Based on the suggestions given by the members, BOS resolved to recommend the following to the Academic Council for further approval.

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE
POLLACHI
DEPARTMENT ZOOLOGY

MINUTES OF BOS MEETING

The 36th Meeting of the Board of studies of the DEPARTMENT ZOOLOGY was held on 22-05-2021 at 10.00 a.m. through online mode

1. The following members were present:

1	Dr. S.Somasundaram Assistant Professor and Head	Chairman
2	Dr. S. Mariselvi, Assistant Professor	Internal Members
3	Ms. S. Jayalakshmi, Assistant Professor	
4	Dr. M. Christobher, Assistant Professor	
5	Dr. M. Durairaju, Associate Professor	
6	Dr. K.Manimegalai Professor, Dept of Zoology, Avinashilingam Institute for Home Science and Higher Education for Women Coimbatore – 641 043.	University Nominee
7	Dr. R. Eswaran	Academic Experts

	Assistant Professor Dept. of Zoology The Madurai College (Autonomous) T.P.K. Road, Madurai - 625 011	
8	Academic Auditor Dr. P. Thiruchenthilnathan Professor, Dept. of Zoology, Periyar University, Salem	
9	Dr. K. Ganeshan Environmental Lab Manager Hubert Envirocare Systems private Ltd, C-45,Baikampady Industrial Estate, Baikampady, Mangalore, Karnataka-575011	Industrial Expert
10	Ms. R. Sindhuja , M.Sc. , B.Ed. 21/Kumarasamy Layout, Near RTO office Udumali Road. Pollachi	Alumnus nominated by Principal / HoD

11.	Ms. S. Radhika Roll No: 18 ZL 36 III-B.Sc., Zoology Nallamuthu Gounder Mahalingam College Pollachi	Student Member
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HoD

CDC Co-ordinator
K. SRINIVASAN, M.C.A.,

Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001

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PRINCIPAL,
PRINCIPAL

H. G. M. COLLEGE, POLLACHI
Dr. R. MANICKACHEZIAN, M.Sc. M.S. Ph.D.,
Controller of Examinations
NGM College (Autonomous),
POLLACHI - 642 001

CHAIRMAN, BOARD OF STUDIES IN THE

Members Present:

The screenshot displays a Google Meet window titled "BOARD OF STUDIES - ZOOLOGY". The interface shows a grid of video feeds for participants. The participant list on the right includes the following names: Ganesan Kittusamy, jaya lakshmi, Mariselvi S, muthusamy durairaju, Radhika S, Sinthuja Ravichandran, and Somasundaram S. The Windows taskbar at the bottom shows the time as 10:17 on 22/05/2021.

Participants visible in the grid:

- You (top left)
- Somasundaram S (top middle)
- Mariselvi S (top right)
- muthusamy durairaju (middle left)
- Thiruchenthinathan P (middle middle)
- Christopher Joel (middle right)
- Eswaran Raju (bottom left)
- Sinthuja Ravichandran (bottom middle)
- Radhika S (bottom right)

Participant list (right sidebar):

- Ganesan Kittusamy
- jaya lakshmi
- Mariselvi S
- muthusamy durairaju
- Radhika S
- Sinthuja Ravichandran
- Somasundaram S

Percentage of Revision of B. Sc Zoology Syllabus under Regulation 2021

S.No	Course Code	Course Title	Content Deleted	Content Updated	Change details	% of Changes	Reason for Change
1.	21UZY101	Core –I Nonchordata	Polymorphism in coelentrates Type study –Nereis	Coral reefs types and formation Type study - Earthworm	Content changed	10%	Subject Expert
2	21UZY203	Core Lab - I (Non-Semester Pattern) Nonchordata & Chordata	Spotters Plasmodium Nereis Corals	Spotters Paramecium Earthworm Sponge Gemmules	Content changed	5%	Subject Expert
3.	21UBY1A1	Allied I Invertebrates and Vertebrates	-	Frog – Brain	Introduced	3%	Course Teacher
4.	21UZY202	Core –II Chordata	Parental care in Frog	-	Content removed	3%	Course Teacher
5.	21UBY2A2	Allied –II Economic Zoology	Vermiculture (Full unit removed)	Unit –IV Cocoon Market Pest Management (full unit introduced)	Full unit revised	23%	Course Teacher
6.	21UZY304	Core –III Cell Biology	-	Unit – 1 Corona virus – SARS COV-2	Content introduced	3%	Course Teacher
7.	21UZY406	Core Lab – II	Spotters: HIV	Spotters: Corona Virus - SARS COV-2	Content changed	3%	Course Teacher
8.	21UZY3N1	Non- Major Elective – I (NME)	Unit – III Blood borne diseases,	-Dermatitis, Fucosidosis - Kwashiorkar, Marasmas	Content changed	3%	Subject expert

		Public Health and Hygiene	Kidney stone				
9.	21UZY3N2	Non- Major Elective – I (NME) Ornamental Fish Culture	Unit – I General structure of fish Unit - II Materials, equipment required for aquarium Construction of home aquarium Structure and location of home aquarium Unit - III Selection of fish for home aquarium Common aquarium fishes Unit – V Bioremedies for fish disease Ornamental fish breeding-cum rearing unit for entrepreneurs	Unit- II Egg layers Live bearer Breeding and spawning of live bearers and egg layers Unit – III Applications of transgenic technology in ornamental fish Maintenance of water quality Unit – IV Nutritional requirements Feeding methods and problems in artificial face.	Content changed	40%	Subject expert
10.	21UZY405	Core –IV Genetics	Unit V 1. Indirect evidences of DNA as genetic material	Unit V 1. Bacteriophage infection	Content changed	3%	Course Teache
11.	21UZY4N21	Food and Nutrition	Unit- V Purification of drinking water	Unit- II Glycemic index	Content changed	3%	Course Teache
12.	21UZY 507	Core – V Developmental Biology	Unit- I 1. Introduction to developmental biology	Unit-I Scope of developmental biology	Content changed	5%	Course Teache
13.	21UZY508	Core – VI Biotechnology	Unit – IV Explants Product harvest Unit- V Biofertilizer	Unit – III Genetically modified organism – Mice and Sheep	Content changed	5%	Subject Expert
14.	21UZY509	Core – VII Biostatistics& Biophysics	-	Unit- III Statistical inference – Procedure of testing a hypothesis Unit- V - Real time PCR	Content added	10%	Subject Expert

15.	21UZY510	Core – VIII Biochemistry	Unit III • Scope of Bioinformatics • Databases ◦ Biological database (Properties and classification) ◦ Specialized database • Protein sequence database – SWISS-PROT • Data mining • Virtual Library Unit –IV • Genomics –Classification and applications • Proteomics –Classification and applications • Drug designing • Human genome project ◦ Goals and techniques ◦ Potential benefits	Unit-IV Metabolism Unit- V Classification of enzymes and coenzymes	Content changed	40%	Course Teache
16.	21UZY 5E1	Core Elective Paper – I Medical Laboratory Techniques	Unit – II Fully removed Unit- IV Naked eye inspection	Unit – II Fully added Unit – IV Physical examination Unit-V Cryopreservation Gamete bank	Content changed	5%	Course Teache
17.	21UZY614	Core Lab – III (Non-Semester Pattern) Developmental Biology, Animal Physiology & Endocrinology,	Spotters Phylogenetic tree (Rooted tree) RasMol (Visualization tool) BLAST Pentose sugar	Spotters Structure of Purine Structure of α -tocopherol Structure of Chymotrypsin Structure of Sucrose	Content changed	15%	Course Teache

		Biostatistics & Biophysics, Biochemistr, MLT, Heamatology and Clinical pathology and Poultry Science and Management					
18.	21UZY 615	Core Lab - IV (Ecology, Evolution, Biotechnology, Microbiology, Sericulture, Insect pest management, Parasitology, Aquaculture, Dairy Farming and management technology and Wild life conservation)	Spotters Microenvironmental studies Micropippete Gill net	Spotters Colony counter Purse Seine net		10%	Course Teache
19.	21UZY612	Core - X Ecology & Evolution		Unit - I Water problems in Aquatic habitat – Fresh, sea and estuary Unit - III Theories of origin of life Unit- IV Neo-Darwininsm Neo-Lamarkism Unit-V Mutation theory of Devries Evolution of Man – Cultural and Biological Fossils of Human Evolution	Content added	30%	Subjec Expert

20.	21UZY613	Core – XI Microbiology and Immunology	Unit II: Bacterial culture- Culture of <i>E.coli</i> Unit III Microorganisms of food Factors influence microbial growth Normal microflora of human body Bacterial diseases- Botulism Viral Disease - Hepatitis	Unit I: Sterilization, Isolation and Maintenance of Microbes Unit II: Biofertilizer- Rhizobium Unit III - Food microbiology: - Food borne diseases, - Food borne infections - Food borne intoxicants - Medical microbiology - Bacterial Diseases - TB, - Viral Diseases – Covid19 - Fungal Diseases- Cutaneous and systemic mycoses - Industrial Microbiology - Fermentor design - Microbial Selection, ethanol and penicillin Production,	Content changed	20%	Subject Expert
21	21UZY6E22	Core Elective -II Insect Pest Management	-	Unit- III Chemical control	Content added	3%	Subject Expert
22.	21UZY6E7	Core Elective – III Aquaculture	-	Unit – II Nutritional requirements	Content added	3%	Subject Expert
23.	21UZY6E32	Core Elective – III Wild Life Conservation	Unit – I fishes, amphibians, reptiles, birds and mammals in India-India as a mega wildlife diversity country Unit- II Natural and artificial regeneration of forests; Harmful Insects and their role in forest economy; Insect pests of important trees of India -Teak, Sal and Bamboo; Beneficial Insects and their role in forest	-	Content removed	20%	Subject Expert

			economy: Scavenger insects dung beetles; Pollinators, Predatory insects, and parasitic insects on insect pests; control of forest insects Unit – III Habitat manipulation: food, water, shade improvement; Making observations and records: field notes, datasheets; Unit-IV Planning census Basic concepts and applications Unit-V Definition, formation, management and administration; Lion and Hangul; Zoos and Zoological Parks: Definition-Aims of Zoos-Formation and Management of Zoos and Zoological Parks -Central Zoo Authority of India; aptive breeding: Aims, Principles, methods; Role of Government and Non-Governmental organizations in conservation				
24	21UZY6E33	Dairy Farming and Management Technology	Unit- I ICMR recommendation of nutrients Role of milk and milk products in human nutrition. Unit –II Fully removed Unit – III Sugar , Minerals and vitamins Unit – IV Clean milk production Unit – V Dairy processing –Milk collection, transportation & Grading of milk Butter –ghee and Ice cream Concentrated and dried milk products	Unit – II Fully added Unit- III Nutritive requirements of dairy cow, maintenance	Content changed	30%	Subject Expert

			Cheese and other fermented products Effective utilization of dairy by-products				
25	21UZY6S22	Biopharmaceuticals	Unit- V Structure of quality management	-	Content removed	3%	Subject Expert

HEAD OF THE DEPARTMENT

22/5/2021
 Assistant Professor and Head
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PRINCIPAL
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N. G. M. COLLEGE, POLLACHI

Department of Zoology

New Course Added: (IF ANY) - (2021-2022)

S.No	Year Batch	Semester	Paper Code	% of Changes	Paper Title	Reason For Change
1.	2021-2024	V	21UZY5E3	100 %	Haematology and Clinical Pathology	Suggested by Subject expert
2.	2021-2024	V	21UZY5AL1	100 %	Advanced Learner Course-I Bioinformatics	Suggested by CDC
3.	2021-2024	V	21UZY5VA	100 %	Value added Course-Food Safety and Hygiene	Suggested by CDC
4.	2021-2024	VI	21UZY6E6	100%	Parasitology	Suggested by Faculty
5.	2021-2024	VI	21UZY6VA	100 %	Value Added Course-Personality Development	Suggested by CDC
6.	2021-2024	VI	21UZY6AL2	100 %	Advanced Learner Course-II Immunotherapeutics	Suggested by CDC


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Coimbatore District

List of Courses having focus on local, national, regional and global developmental needs offered by the Department of Zoology

S.No	Semester	Course Code	Name of the course	Local	National	Regional	Global
1.	I	21UZY101	Core - I :Nonchordata		√		
2.	I	21UBY1A1	Allied - I :Nonchordata and Chordata		√		
3.	II	21UZY202	Core - II :Chordata		√		
4.	II	21UZY203	Core Lab - I: Nonchordata & Chordata (Non-Semester Pattern)		√		
5.	II	21UBY2A2	Allied - II :Economic Zoology	√	√	√	
6.	II	21UBY2A3	Allied Lab : Paper I & II (Non-Semester Pattern)		√	√	
7.	II	21EVS201	Environmental Studies		√	√	√
8.	III	21UZY304	Core - III: Cell Biology		√		
9	III	21UZY3N11	Non Major Elective - I : Public Health and Hygiene	√	√		
10.	III	21UZY3N12	Non Major Elective - I : Ornamental Fish Culture	√	√	√	
11.	IV	21UZY405	Core - IV :Genetics				√
12.	IV	21UZY406	Core Lab - II : Cell biology & Genetics (Non-Semester Pattern)		√		
13.	IV	21UZY4N21	Non Major Elective - II :Food and Nutrition	√	√		
14.	IV	21UZY4N22	Non Major Elective - II : Apiculture	√			
15.	V	21UZY507	Core - V: Developmental Biology		√	√	
16.	V	21UZY508	Core - VI :Biotechnology		√	√	√

S.No	Semester	Course Code	Name of the course	Local	National	Regional	Global
			Skill Enhanced Course				
17.	V	21UZY509	Core - VII : Biostatistics & Biophysics		√	√	√
18.	V	21UZY510	Core - VIII : Biochemistry		√		
19	V	21UZY5E11	Core Elective - I : Medical Laboratory Techniques	√	√	√	
20.	V	21UZY5E12	Core Elective - I : Poultry Science and Management	√	√	√	
21.	V	21UZY5E13	Core Elective - I : Haematology and Clinical Pathology	√	√	√	
22.	V	21UZY5AL1	Advanced Learner Course – I Bioinformatics (Optional) - Self Study		√		√
23.	V	21UZY5S11	Skill Based Elective - I : Network and Information Security (Online)				√
24.	V	21UZY5S12	Skill Based Elective - I : Cyber security – Ethical Hacking (Online)				√
25.	VI	21UZY611	Core - IX : Animal Physiology and endocrinology		√		
	VI	21UZY612	Core - X : Ecology and Evolution	√	√	√	√
26.	VI	21UZY613	Core - XI : Microbiology and Immunology -Skill Enhanced Course	√	√		
27.	VI	21UZY6E21	Core Elective - II : Sericulture	√	√	√	
28.	VI	21UZY6E22	Core Elective - II : Insect Pest Management	√	√	√	
29.	VI	21UZY6E23	Core Elective - II : Parasitology	√	√	√	
30	VI	21UZY6E31	Core Elective - III : Aquaculture	√	√	√	
31	VI	21UZY6E32	Core Elective - III : Wild life Conservation		√	√	

S.No	Semester	Course Code	Name of the course	Local	National	Regional	Global
32	VI	21UZY6E33	Core Elective –III Dairy farming and Management Technology	√	√	√	
33	VI	21UZY614	Core Lab- III : Developmental Biology, Animal Physiology & Endocrinology, Biostatistics & Biophysics, Biochemistry, MLT, Hematology and Clinical pathology and Poultry Science and Management (Non-Semester Pattern)	√	√	√	
34	VI	21 UZY615	Core Lab- IV: Ecology, Evolution, Biotechnology, Microbiology, Sericulture, Insect pest management, Parasitology, Aquaculture, Dairy Farming and management technology and Wild life conservation (Non-Semester Pattern)	√	√	√	
35	VI	21UZY6AL2	Advanced Learner Course - II Immunotherapeutics (Optional) - Self Study		√		√
36	VI	21UZY6S21	Skill Based Elective - II : Vermiculture	√	√	√	
37	VI	21UZY6S22	Skill Based Elective - II : Biopharmaceuticals		√	√	

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List of Courses having focus on employability/ entrepreneurship/ skill development offered by the Department Zoology

S.No	Semester	Course Code	Name of the course	Skill develop-ment	Entrep-reneur-ship	Employabi-lity	Year of Introducti-on
1.	I	21UZY101	Core - I :Nonchordata	✓			1987
2.	I	21UBY1A1	Allied - I :Nonchordata and Chordata	✓	✓		1987
3.	II	21UZY202	Core - II :Chordata	✓			1987
4.	II	21UZY203	Core Lab - I: Nonchordata & Chordata (Non-Semester Pattern)	✓			1987
5.	II	21UBY2A2	Allied - II :Economic Zoology	✓			2018
6.	II	21UBY2A3	Allied Lab : Paper I & II (Non-Semester Pattern)	✓			1987
7.	II	21EVS201	Environmental Studies	✓			
8.	III	21UZY304	Core - III: Cell Biology	✓			1987
9	III	21UZY3N11	Non Major Elective - I : Public Health and Hygiene	✓			2004
10.	III	21UZY3N12	Non Major Elective - I : Ornamental Fish Culture	✓	✓	✓	2011
11.	IV	21UZY405	Core - IV :Genetics	✓			1987
12.	IV	21UZY406	Core Lab - II : Cell biology & Genetics (Non-Semester Pattern)	✓			1987
13.	IV	21UZY4N21	Non Major Elective - II :Food and Nutrition	✓			2004
14.	IV	21UZY4N22	Non Major Elective - II : Apiculture	✓	✓	✓	2004
15.	V	21UZY507	Core - V: Developmental Biology	✓			2019

S.No	Semester	Course Code	Name of the course	Skill develop ment	Entrep reneur ship	Employabi lity	Year of Introducti on
16.	V	21UZY508	Core - VI :Biotechnology Skill Enhanced Course	✓			1987
17.	V	21UZY509	Core - VII : Biostatistics & Biophysics	✓			1987
18.	V	21UZY510	Core - VIII : Biochemistry	✓		✓	2021
19	V	21UZY5E11	Core Elective - I : Medical Laboratory Techniques	✓		✓	1987
20.	V	21UZY5E12	Core Elective - I : Poultry Science and Management	✓	✓	✓	2011
21.	V	21UZY5E13	Core Elective - I : Haematology and Clinical Pathology	✓		✓	2021
22.	V	21UZY5AL1	Advanced Learner Course – I Bioinformatics (Optional) - Self Study	✓			2021
23.	V	21UZY5S11	Skill Based Elective - I : Network and Information Security (Online)	✓			2019
24.	V	21UZY5S12	Skill Based Elective - I : Cyber security – Ethical Hacking (Online)	✓			2019
25.	VI	21UZY611	Core - IX :Animal Physiology and endocrinology			✓	2019
	VI	21UZY612	Core - X :Ecology and Evolution	✓			1987
26.	VI	21UZY613	Core - XI : Microbiology and Immunology -Skill Enhanced Course			✓	1987
27.	VI	21UZY6E21	Core Elective - II : Sericulture	✓	✓	✓	1987
28.	VI	21UZY6E22	Core Elective - II :Insect Pest Management	✓		✓	2004
29.	VI	21UZY6E23	Core Elective - II : Parasitology	✓		✓	2021

S.No	Semester	Course Code	Name of the course	Skill develop ment	Entrep reneur ship	Employabi lity	Year of Introducti on
30	VI	21UZY6E31	Core Elective - III :Aquaculture	✓	✓	✓	1987
31	VI	21UZY6E32	Core Elective - III : Wild life Conservation	✓			2020
32	VI	21UZY6E33	Core Elective -III Dairy farming and Management Technology	✓	✓	✓	2004
33	VI	21UZY614	Core Lab- III : Developmental Biology, Animal Physiology & Endocrinology, Biostatistics & Biophysics, Biochemistr, MLT, Haematology and Clinical pathology and Poultry Science and Management (Non-Semester Pattern)	✓		✓	1987
34	VI	21 UZY615	Core Lab- IV: Ecology, Evolution, Biotechnology, Microbiology, Sericulture, Insect pest management, Parasitology, Aquaculture, Dairy Farming and management technology and Wild life conservation (Non-Semester Pattern)	✓		✓	1987
35	VI	21UZY6AL2	Advanced Learner Course - II Immunotherapeutics (Optional) - Self Study	✓			2021
36	VI	21UZY6S21	Skill Based Elective - II : Vermiculture	✓	✓	✓	2011
37	VI	21UZY6S22	Skill Based Elective - II : Biopharmaceuticals	✓		✓	2004

HEAD OF THE DEPARTMENT

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Nallamuthu Gounder Mahalingam College - Curriculum Development Cell
B. Sc. Zoology Scheme of Examination For (2021 – 2024Batch),
Choice Based Credit System & OBES

For Part I and Part II for Four Semesters										
SEMESTER – I										
Part	Subject Code	Title of the Paper	Hrs / Week		Hrs / Sem.	Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P	T		Internal	External		
I	21UTL101 / 21UHN101 / 21UFR101	Tamil Paper - I /	6	-	-	3	50	50	100	3
		Hindi Paper - I /		-	-					
		French Paper – I		-	-					
II	21UEN101	Communication Skills - I (Level I)	5	-	-	3	50	50	100	3
	21UEN102	Communication Skills - I (Level II)		-	-					
III	21UZY101	Core - I :Nonchordata	6	-	-	3	50	50	100	5
		Core Lab -I : Nonchordata and Chordata (Non semester pattern)	-	3	-	-	-	-	-	-
	21UZY1A1	Allied - I :Allied Botany Paper I: Invertebrates and Vertebrates	6	-	-	3	50	50	100	4
		Allied Lab -I : Practical I (Paper I &II)	-	2	-	-	-	-	-	-
IV	21UHR101	Human Rights	1	-	-	2		50	50	2
	21HEC101	Human Excellence - Personal Values & SKY Yoga Practice – I	1	-	-	2	25	25	50	1
V		Extension Activities – Annexure I	-	-	-	-	-	-	-	-
CC	21 CFE101	Fluency in English-I	-	-	-	-	-	-	-	-
		Online Course (Optional) (MOOC/NPTEL/SWAYAM)								Grade
Total									500	18

SEMESTER – II									
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Part	Subject Code	Title of the Paper	Hrs / Week		Hrs / Sem.	Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P	T		Internal	External		
I	21UTL202 / 21UHN202 / 21UFR202	Tamil Paper - II /	6	-	-	3	50	50	100	3
		Hindi Paper - II /		-	-					
		French Paper – II		-	-					
II	21UEN202	Communication Skills - II (Level I)	5	-	-	3	50	50	100	3
	21UEN203	Communication Skills - II (Level II)		-	-					
III	21UZY202	Core - II :Chordata	6	-	-	3	50	50	100	4
	21UZY203	Core Lab - I: Nonchordata & Chordata (Non-Semester Pattern)	-	2	-	3	50	50	100	4
	21UBY2A2	Allied - II :Economic Zoology	6	-	-	3	50	50	100	4
	21UBY2A3	Allied Lab : Paper I & II (Non-Semester Pattern)	-	2	-	3	50	50	100	2
IV	21EVS201	Environmental Studies	2	-	-	2		50	50	2
	21HEC202	Human Excellence - Family Values & SKY Yoga Practice – II	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	21CFE202	Fluency in English-II	-	-	-	-	-	-	-	-
	21CMM201	Manaiyiyal Mahathuvam-I	1	-	-	2	-	50	50	Grade
	21 CUB201	Uzhavu Bharatham-I	1	-	-	2	-	50	50	Grade
		Online Course (Optional) (MOOC/NPTEL/SWAYAM)								Grade
Total									700+ 100*	23

SEMESTER – III

Part	Subject Code	Title of the Paper	Hrs / Week		Hrs / Sem.	Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P	T		Internal	External		
I	21UTL303 / 21UHN303/ 21UFR303	Tamil Paper - III /	5	-	-	3	50	50	100	3
		Hindi Paper - III/								
		French Paper – III								
II	21UEN303	Communication Skills - III (Level I)	6	-	-	3	50	50	100	3
	21UEN304	Communication Skills - III (Level II)		-	-					
III	21UZY304	Core - III: Cell Biology	6	-	-	3	50	50	100	5
		Core –Lab II: Cell biology & Genetics (Non-Semester Pattern)	-	3	-	-	-	-	-	-
	21UZY3A4	Allied - III :Ancillary Chemistry (offered by Department of Chemistry)	6	-	-	3	50	50	100	4
		Allied Lab - II : Chemistry(offered by Department of Chemistry)	-	2	-	-	-	-	-	-
IV	21UZY3N1 / 21UZY3N2	Non Major Elective - I : Public Health and Hygiene/ Non Major Elective - I : Ornamental Fish Culture	1	-	-	2		50	50	2
	21HEC303	Human Excellence - Professional Values & Ethics – III	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	21CFE303	Fluency in English-III	-	-	-	-	-	-	-	-
	21CMM302	Manaiyiyal Mahathuvam-II	1	-	-	2	-	50	50	Grade
	21 CUB302	Uzhavu Bharatham-II	1	-	-	2	-	50	50	Grade
Total									500+ 100*	18

SEMESTER – IV

Part	Subject Code	Title of the Paper	Hrs / Week		Hrs / Sem.	Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P	T		Internal	External		
I	21UTL404 / 21UHN404 / 21UFR404	Tamil Paper - IV /	5	-	-	3	50	50	100	3
		Hindi Paper - IV/								
		French Paper – IV								
II	21UEN403	Communication Skills - IV (Level I)	6	-	-	3	50	50	100	3
	21UEN404	Communication Skills - IV (Level II)		-	-					
III	21UZY405	Core - IV :Genetics	6	-	6	3	50	50	100	5
	21UZY406	Core Lab - II : Cell biology & Genetics (Non-Semester Pattern)	-	3	-	3	50	50	100	4
	21UZY4A5	Allied - IV :Ancillary chemistry Paper II(offered by Department of Chemistry)	6	-	-	3	50	50	100	4
	21UZY4A6	Allied Lab-II:Chemistry (offered by Department of Chemistry)	-	2	-	3	50	50	100	2
IV	21UZY4N3/ 21UZY4N4	Non Major Elective - II :Food and Nutrition / Non Major Elective - II : Apiculture	1	-	-	2		50	50	2
	21HEC404	Human Excellence - Social Values & SKY Yoga Practice – IV	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	50	50	1
CC	21CFE 404	Fluency in English-IV	-	-	-	-	-	-	-	-
	21CMM403	Manaiyiyal Mahathuvam-III	1	-	-	2	-	50	50	Grade
	21 CUB403	Uzhavu Bharatham-III	1	-	-	2	-	50	50	Grade
Total									750+ 100*	25

SEMESTER – V

Part	Subject Code	Title of the Paper	Hrs / Week		Hrs /Sem.	Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P			Internal	External		
III	21UZY507	Core - V: Developmental Biology	5	-	-	3	50	50	100	4
	21UZY508	Core - VI :Biotechnology Skill Enhanced Course	5	-	-	3	50	50	100	4
	21UZY509	Core - VII : Biostatistics & Biophysics	5	-	5	3	50	50	100	4
	21UZY510	Core - VIII : Biochemistry	5	-	-	3	50	50	100	4
	21UZY5E1 / 21UZY5E2 / 21UZY5E3	Core Elective - I : Medical Laboratory Techniques/ Core Elective - I : Poultry Science and Management Core Elective - I : Haematology and Clinical Pathology	4	-	-	3	50	50	100	4
	21UZY614	Core Lab- III: Developmental Biology, Animal Physiology & Endocrinology, Biostatistics & Biophysics, biochemistry & MLT (Non-Semester Pattern)	-	2	10	-	-	-	-	-
	21 UZY615	Core Lab- IV: Ecology, Evolution, Biotechnology, Microbiology , Sericulture and Aquaculture (Non-Semester Pattern)	-	2	-	-	-	-	-	-
	21UZY5AL	Advanced Learner Course – I Bioinformatics (Optional) - Self Study					50	50	100*	5*
	21UZ 5VA	Value Added Course - Food safety and Hygiene(Optional)	30					50	50*	2*

IV	21UZY5S1 / 21UZY5S2	Skill Based Elective - I : Network and Information Security (Online)/ Skill Based Elective - I : Cyber security – Ethical Hacking (Online)	1			2		50	50	2
	21HEC505	Human Excellence - National Values & SKY Yoga Practice – V	1	-	-	2	25	25	50	1
	21GKL501	General Awareness - Self Study	SS			2	-	50	50	2
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	21CFE505	Fluency in English-V	-	-	-	-	-	-	-	-
	21CSD501	SoftSkills Development -I	-	-	-	-	-	-	-	Grade
Total									650+150*	25+7*
SEMESTER – VI										
Part	Subject Code	Title of the Paper	Hrs / Week	Hrs / Sem.		Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P	T		Internal	External		
III	21UZY611	Core - IX :Animal Physiology and endocrinology	5	-	-	3	50	50	100	4
	21UZY612	Core - X :Ecology and Evolution	5	-	-	3	50	50	100	4
	21UZY613	Core - XI : Microbiology and Immunology -Skill Enhanced Course	5	-	-	3	50	50	100	4
	21UZY6E4/ 21UZY6E5/ 21UZY6E6	Core Elective - II : Sericulture/ Core Elective - II :Insect Pest Management / Core Elective - II : Parasitology	4	-	-	3	50	50	100	4
	21UZY6E7 / 21UZY6E32/ 21UZY6E33	Core Elective - III :Aquaculture / Core Elective - III : Wild life Conservation/ Core Elective –III Dairy farming and Management Technology	5	-	-	3	50	50	100	4
	21UZY614	Core Lab- III : Developmental Biology, Animal Physiology & Endocrinology, Biostatistics	-	2	10	3	50	50	100	4

		&Biophysics, Bioinformatics &Biochemistry , Haematology and Clinical Pathology & MLT (Non-Semester Pattern)								
	21 UZY615	Core Lab- IV: (Non-Semester Pattern) Ecology, Evolution, Biotechnology, Microbiology , Sericulture and Aquaculture	-	2	-	3	50	50	100	4
	21UZY6AL	Advanced Learner Course - II Immunotherapeutics (Optional) - Self Study					50	50	100*	5*
	21UZY6VA	Value Added Course- Personality Development (Optional)	30	-	-	-	-	50	50*	2*
IV	21UZY6S3/ 21UZY6S4	Skill Based Elective - II : Vermiculture / Skill Based Elective - II : Biopharmaceuticals	1			2		50	50	2
	21HEC606	Human Excellence - Global Values & SKY Yoga Practice – VI	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	21CFE606	Fluency in English-VI	-	-	-	-	-	-	-	-
	21CSD602	Soft Skills Development -II	-	-	-	-	-	-	-	Grade
Total									800+150*	31+7*

AL - Advanced Learner Course (Optional) ;VA-Department Specific Value Added Course

CC – Certificate Course / Co-scholastic Course;*Extra Credits, Extra Hour Course

Grand Total = 3900; Total Credits = 140


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Principal

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PRINCIPAL i/c
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Pollachi - 642 001, Coimbatore District.

Programme code:	B. Sc.,			Programme Title :	Bachelor of Zoology	
Course Code:	21UBY2A2			Title	Batch :	2021-2024
				Allied Paper – II Economic Zoology	Semester	II
Lecture Hrs/Week	6	Tutorial Hours/ Sem	---		Credits:	4

Course Objectives

Acquire the knowledge on application of zoology in the field of aquaculture, apiculture, dairy farming, sericulture, poultry keeping, and pest and pest management.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge level
CO1	Remember knowledge of applied biological sciences such as aquaculture , apiculture, sericulture	K1
CO2	Elucidate rearing methods of beneficial organisms – an economic perspectives	K2
CO3	Apply the knowledge of rearing of silk and lucrative sale in cocoon market	K3
CO4	Analysis method of poultry farming, identify the poultry disease and control measure	K4
CO5	Discuss the importance of agricultural pests and methods of their control.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	H	M	L	M	M	H	H	H	H
CO2	M	L	L	L	H	M	H	M	M
CO3	M	L	M	M	M	H	H	M	H
CO4	H	M	L	L	M	H	H	H	H
CO5	H	M	M	L	L	M	H	M	M

Units	Content	Hrs
Unit I	AQUACULTURE - Scope of Aquaculture - Type of Fisheries - Inland fisheries and Marine fisheries - Culturable organisms - Fin fishes - Diseases of Fish - Bacterial - Erythroderma , Bacterial Gill Rot - Viral - EUS,IPN, VHS - Fungal - Saprolegniasis - Oyster culture - Edible oyster and Pearl oyster	18
Unit II	APICULTURE - Scope of Apiculture <i>Apis indica</i>, <i>Apis. mellifera</i> and <i>Apis dorsata</i> - Products of Bee Keeping - Royal jelly, Honey, Wax and Bee venom DAIRY FARMING	18

	• Scope of dairy farming • A typical dairy farm • Dairy animals: cow • Live stock diseases - Mastitis and Foot and Mouth disease(FMD) • <i>Nutritive value of milk*</i> • Dairy By-products	
Unit III	SERICULTURE • Scope of sericulture • Optimum conditions for mulberry growth • Vegetative preparation – Stem cutting • Structure of silkworm • Structure of silk gland • Life cycle of <i>Bombyx mori</i> • Rearing appliances • Disinfection • Diseases of silkworm -Pebrine and Viral flacherie • Cocoon market	18
Unit IV	POULTRY KEEPING • Scope of poultry • Construction of poultry house • Rearing of Broilers and Layers • Diseases of poultry 1. Fowl pox 2. Coccidiosis 3. Ranikhet disease 4. Bird Flu • <i>Nutritive value of Egg*</i>	18
Unit V	PEST MANAGEMENT • Scope of Pest management • Types of Pest • Pest of coconut, Sugarcane and Paddy • Vectors ○ <i>Culex quinquefasciatus</i>(Mosquito) ○ <i>Cimex lectularius</i> (Bedbugs) ○ <i>Pediculus capitis</i> (Head lice) • Methods of pest control - biological, chemical and cultural • Integrated pest Management	18
Total Contact Hrs		90

* denoted as self study topic

Pedagogy

Direct Instruction, Digital Presentation
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Assessment Methods:

Seminar, Quiz, Assignments, Group Task.

Text Book

1. Tarit Kumar Banerjee, Applied Zoology, New central book agency pvt. ltd. Kolkata (2017)
2. Shukla & Upadhya, Economic Zoology - Rastogi Publication, Shivaji Road, Meerut (2001)

Reference Books

1. Ganga and Sulochana Chetty, An introduction to sericulture, 2nd Edition, Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi (1999)
2. Arumugam, N Economic Zoology, Saras Publication, 114/35 G ARP Camp Road, Periavilai, Nagercoil, 1st edition, (2013)
3. Ezhili, N. & Thirumathal, K A hand book for sericulture, Shrishti Impression, Coimbatore . (2008)
4. Tripaty, S.N. Food biotechnology. Doarinant Publishing and distributions, New Delhi. (2004)
5. Arumugam, N. Applied Zoology, Saras Publication, 114/35 G ARP Camp Road, Periavilai, Nagercoil, (2020)


Head of the Department
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Principal
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Programme code:	B. Sc		Programme Title :	Bachelor of Zoology	
Course Code:	21UZY3N2		Title	Batch :	2021-2024
			Non- Major Elective -I	Semester	III
Lecture Hrs/Week	1	Tutorial Hrs/ Sem	--	Credits:	2

Course Objectives

Student will learn the importance of ornamental fish culture, maintain an aquarium, know the common ornamental fishes and explore the self employment opportunities.

Course Outcomes

On the successful completion of the course, students will be able to

CO Numbers	CO Statement	Knowledge level
CO1	Remember knowledge of general ornamental fishes	K1
CO2	Demonstrate the construction of home aquarium	K2
CO3	Apply the ornamental fish culture methods for aquarium maintenance	K3
CO4	Compare the various types of fish feed and feed formulation	K4

CO5	Determine the various fish diseases, diagnosis and treatment	K5
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Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	H	M	L	L	L	M	H	H	M
CO2	M	L	M	M	M	L	H	H	H
CO3	M	L	L	M	M	M	H	M	M
CO4	H	M	M	L	L	H	H	H	L
CO5	L	M	L	L	L	L	H	L	M

Units	Content	Hrs
Unit I	• Scope of ornamental fish culture ○ General characters of fish ○ Digestive system ○ Reproductive system	3
Unit II	• Egg layer ○ <i>Carassius auratus</i> ○ <i>Pterophyllum scalare</i> ○ <i>Beta splendens</i> • Live bearers ○ <i>Xiphophorus helleri</i> ○ <i>Xiphophorus maculatus</i> ○ <i>Poecilia reticulata</i>. • Breeding and spawning of live bearers and egg layers.	3
Unit III	• Applications of transgenic technology in ornamental fish - Zebrafish • Aquarium ○ Requirements for an aquarium ○ setting of an aquarium* ○ Maintenance of water quality	3
Unit IV	• Ornamental fish feeds and nutritional requirement • Types of feeds • Live feed ○ Artemia ○ Daphnia ○ Tubifex ○ Rotifers and Cyclops. • Artificial feed ○ Simple and compound ○ Composition of an ideal fish feed ○ Preparation of artificial feed • Feeding methods and Problems in artificial feed*	3
Unit V	• Diseases of Ornamental Fishes and their Control • Parasitic ○ Argulus ○ Lernaeasis	

	• Protozoan ○ Ichthyophthiriasis ○ Costiasis • Bacterial- Fin and Tail rot • Fungal - Saprolegniosis • Nutritional diseases, their diagnosis and Treatment	3
Total Contact Hrs		15

* denoted as self study topic

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Seminar, Quiz, Assignments, Group Task.

Text Book

1. Pandey and Shukla, Fish and fisheries. Rastogi publication (2018)
2. Jordan, E.L. and Verma, P.S. Chordate Zoology. S. Chand & Company LTD., Ram Nagar, New Delhi. 110055. (2006)

Reference Books

1. Dhote. A.K Publication Department – NCERT — 55 Inland fishery – Instructional – cum – Practical -Manual Vol IV Aquaculture. (1989)
2. Agarwal, S.C A hand book of fish farming. B.H.Enterprises. New Delhi(1994)
3. Biswas, K. P. A Text book of fish& Fisheries Technology - Calcutta(W.B) 2nd Edition, Published by Narendra Publishing house, Delhi (1996)
4. Jhingran, V. G. Fish and Fisheries of India - Hindustan Publishing Corporation (India) Delhi, Printed in India at Gopsons papers Pvt Ltd, Noida (1988)
5. Arumugam, N. Aquaculture SARAS Publications, Nagercoil, Tamilnadu. (2020)

Programme Code:	B.Sc.,			Programme Title:	Bachelor of Zoology	
Course Code:	21UZY510			Title	Batch:	2021 – 2024
				Core - VIII Biochemistry	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	--		Credits:	4

Course Objective

To understand the structure of biomolecules with emphasis on the techniques used for structure determination and aims to enlighten the students how structural information can be utilized for better understanding of biological processes and adaptation of animals physiologically to environmental challenges

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
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CO1	Remember basic principles of biochemistry, structure of chemical bonds and their significance in biological system	K1
CO2	Understand the structure and function of carbohydrates, their metabolism and regulatory mechanisms.	K2
CO3	Analyse the role of lipids and fatty acids in various regulatory mechanisms and their metabolism and regulation.	K3
CO4	Apply the knowledge how proteins, enzymes and vitamins influence the biological processes and their architecture.	K4
CO5	Integrate the knowledge of vitamins and enzymes in various industries and interpret the mechanism of action of various drugs and their catalytic properties.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	M	H	--	M	L		M	M	M
CO2	--	M	--	M	--	--	L	M	M
CO3	--	M	--	M	--	--	L	M	M
CO4	L	H	M	H	L	--	M	H	M
CO5	--	M	--	M	--	--	H	M	H

Units	Content	Hrs
Unit I	Biochemistry • Scope of Biochemistry ○ Atoms, molecules, water ○ Functional groups • Chemical bonds of Biomolecules • Classification of Carbohydrates: ○ Monosaccharides - Pentoses ○ Disaccharides ○ Polysaccharides- Homopolysaccharide and Heteropolysaccharide	15
Unit II	• Classification of Lipids: ○ Simple Lipids - Fats ○ Compound lipids -Phospholipids ○ Derived lipids -Glycerol ○ <i>Lipids associated Obesity disorders.*</i>	15
Unit III	• Classification of Proteins: ○ Structure: Simple – Conjugated and Derived proteins. ○ Solubility: Globular and Fibrous proteins ○ Biosynthesis of glutamic acid, phenyl alanine, methionine,histidine	15

Unit IV	• Metabolism ○ Carbohydrates: Glycolysis-Glycogenesis- Kreb's cycle & Glycogenolysis ○ lipids :β-oxidation of fatty acids ○ Proteins: Transamination, Deamination, decarboxylation, ornithine cycle.	15
Unit V	• Classification of Enzymes, Co-Enzymes and Vitamins ○ Nomenclature and properties. ○ Factors influencing enzyme action. ○ Enzyme inhibition. ○ Salient features of co enzymes ○ Types and <i>Properties of vitamins</i>.	15
	Total Contact Hrs	75

*- denoted as self study topics

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Seminar, Quiz, Assignments, Group Task.

Text Book

1.Satyanarayana U. Biochemistry , Book Syndicate Pvt. Ltd. 2008

Reference Books

1. Nelson, D.L. & Cox, M.M. Lehninger Principles of Biochemistry (7th edition) Worth. 2017
2. Rastogi S. C. Biochemistry .Tata McGraw Hill Publishing Co. Ltd. 2003
3. Thulsi Fatima. Biochemistry - Saras Publication,114/35G, A.R.P Camp Road, Periaivilai, Kottar Post, Nagercoil - 629002 , Tamil nadu, India. 2016
4. Sathyanarayana U.& Chakrapani, U. 2nd Edition, Essential of Biochemistry - Books & Allied pvt.ltd 83/1, Beliaghata main road, Kolkata 700010, India. 2009.
5. Lehninger A., Nelson D. L. and Cox M. M. Principles of Biochemistry. CBC Publishers.1993.


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Programme Code:	B.Sc.,		Programme Title:	Bachelor of Zoology	
Course Code:	21UZY612		Title	Batch:	2021 – 2024
			Core–X Ecology and Evolution	Semester:	VI
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Credits:	4

Course Objective

To know about the basic concepts of Ecology, origin of life, animal population animal relationships and Evolution.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the importance of abiotic factors and origin of life	K1
CO2	Understand the basic concepts of animal relationship and fossils	K2
CO3	Apply knowledge about animal ethics and evidences of evolution	K3
CO4	Analyze the animal population and organic evolution of man	K4
CO5	Gain the knowledge about biogeochemical cycles.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	H	H	H	M	H	L	M	H	H
CO2	M	H	H	M	M	H	L	M	H
CO3	M	H	H	L	M	H	H	M	H
CO4	H	H	H	L	M	H	M	H	H
CO5	M	H	H	H	M	M	L	H	H

Units	Content	Hrs
Unit I	• Scope of ecology • Abiotic factors ○ Soil: Pedogenesis - texture- profile – fauna and soil erosion. ○ <i>Water: Properties*</i> ○ Water problems in aquatic habitat – Fresh water, Sea water and Estuary water ○ Temperature: Range - Thermal stratification- biological effects of temperature ○ Light: biological effects of light	15
Unit II	• Biogeochemical cycle ○ Gaseous cycle : Carbon- Nitrogen ○ Sedimentary cycle: Sulphur- Phosphorus • Animal relationship ○ Commensalism	15

	○ Mutualism ○ Parasitism • Animal population ○ Characteristics of population - Natality- mortality- growth- density • Human Ecology ○ Population growth (Explosion), Population control • Space Ecology ○ Physiological changes during space travel.	
Unit III	• Theories of origin of life • Biochemical origin of life • <i>Urey and Miller's experiment*</i> • Evidences of evolution ○ Morphological: Homologous structures – vestigial organs – connecting links ○ Embryological: Recapitulation theory • Palaeontological : Missing links	15
Unit IV	• Darwinism • Neo Darwinism • Lamarckism • Neo Lamarckism	15
Unit V	• Mutation theory of DeVries • Geological time scale • Fossils: Types • Dating of fossils • Evolution of man – Cultural and Biological	15
	Total Contact Hrs	75

**denoted as self study topic*

Pedagogy

Direct Instruction, Digital Presentation
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Assessment Methods:

Seminar, Quiz, Assignments, Group Task.

Text Book

1. Verma and Agarwal. Principles of Ecology. S. Chand & Company, Ltd. New Delhi, 1100555th edition(2003).
2. Saha, T. K. Life: Origin, evolution and adaptation. Books and allied (P) Ltd. Kolkata – 700 010, 1st edition(2002)

Reference Books

1. Odum E. P. Fundamentals of ecology . W. B. Saunders Company, London. 1st edition. (1971).
2. N.Arumugam- Ecology, Toxicology and Evolution, Saras Publications, Kanyakumari(2015)
3. Tomar and Singh, Evolutionary Biology – Rastogi Publication, Meerut. 250 0028th edition(2010).
4. Arumugam N. Concepts of ecology. Saras publication 114/35 G, A.R.P Camp Road, Periyavillai, Kottar PO, Nagercoil -629 002, Kanyakumari (2021).
- 5.Arumugam N. Organic Evolution— Saras publication 114/35 G, A.R.P Camp Road, Periyavillai, Kottar PO, Nagercoil -629 002, Kanyakumari(2015)


Head of the Department

Dr. S. SOMASUNDARAM M.Sc., Ph.D.,
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Principal

Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D.,
PRINCIPAL i/c
Nallamuthu Gounder Mahalingam College
Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc.,			Programme Title:	Bachelor of Zoology	
Course Code:	21UZY613			Title	Batch:	2021 – 2024
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	--	Core XI - Microbiology and Immunology-Skill enhancement course	Semester:	VI
					Credits:	4

Course Objective

To acquire a basic knowledge of microbiology and immunology, working mechanism of immunity, basic methods in microbiology, classification of microorganisms and Immunity and applications of microbiology and immunology

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind the scope of microbiology and immunology	K1
CO2	Understand the classification of microorganisms and immunity	K2
CO3	Apply the knowledge about applied microbiology	K3
CO4	Analyse the types of Immunity involved in our body against pathogen	K4
CO5	Acquire the knowledge of microorganisms and immunity	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	H	M	H	H	M	H	H	H	H
CO2	H	M	H	H	M	H	H	H	M
CO3	M	H	H	H	M	H	H	H	H
CO4	M	H	H	H	M	H	H	M	H
CO5	H	M	H	H	M	H	H	M	H

Units	Content	Hrs
Unit I	- Introduction and scope of microbiology - Classification of Bacteria, virus, Fungi Basic methods in Microbiology - Pure culture - purification techniques - Types of culture media - Preparation of Culture media - Culture techniques of microorganisms - Bacterial growth and Growth curve	15

	• Staining procedure and types of staining • Sterilization, Isolation and Maintenance of Microbes	
Unit II	• Bacteria: ○ Major features and structure of bacteria ○ Economic importance of bacteria • Viruses: ○ Characteristic and structure of viruses ○ Structure of Bacteriophage • Applied microbiology ▪ Agricultural microbiology: ▪ Role of microorganism in soil fertility ▪ Biofertilizers-Rhizobium ▪ Role of microorganism in agriculture	15
Unit III	• Food microbiology: ▪ Food spoilage ▪ Food borne diseases, ▪ Food borne infections ▪ Food borne intoxicans ▪ <i>Food preservation*</i> • Medical microbiology ▪ Bacterial Diseases -TB, Cholera ▪ Viral Diseases – Measles, Covid19 ▪ Fungal Diseases- Cutaneous and systemic mycoses • Industrial Microbiology ▪ Fermentor design ▪ Microbial Selection, ethanol and penicillin Production	15
Unit IV	• Immunology ○ Introduction and scope of immunology • Classification of Immunity ○ Innate Immunity ○ Acquired Immunity • Immune Response ○ Mechanism of Humoral immune response ○ Mechanism of Cell mediated immune response • Lymphoid Organs ○ Primary lymphoid organs ○ Secondary lymphoid organs	15
Unit V	• Cells of the immune system ○ Lymphoid lineage ○ Myeloid lineage • Immunoglobulins ○ Structure of immunoglobulin ○ Classes and properties of immunoglobulin • Major Histocompatibility complex-Classification of MHC • Tumor immunology ○ Types of tumor	15

	○ <i>Properties and causes of tumor cells*</i> ○ Causes of tumour ○ Factors involved in tumor immunity ○ Immune diagnosis and immunotherapy of tumor	
	• Total contact Hrs	75

* denoted as self study topics

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Seminar, Quiz, Assignments, Group Task.

Text Book

1. Dubey R. C. and Maheswari, D.K. A Text book of Microbiology, S. Chand Publishers, (2013)
2. Shyamasree ghosh, Immunology and Immunotechnology –Books and allied (P) Ltd. (2017)

Reference Books

1. Ryan KJ, Ray CG, Editors. Sherris Medical Microbiology 7th Edition, MCGraw Hill Education Singapore(2018)
2. Willey JM, Sherwod L, Woolverton CJ Prescotts Microbiology, MCGraw Hill Education Singapore(2017)
3. Atlas RM. Principles of Microbiology, 1st Edition, Mosby- Yearbook, Inc Missouri(1995)
4. John.E.Smith, Biotechnology – Vikas Publishing House Pvt. Ltd, New Delhi(1993)
5. Mani. A., Selvaraj. A.M., Narayanan, L. M. and Arumugam, N. Microbiology. Saras publications, 114/35 G, A.R.P Camp Road, Periaivillai, Kottar PO, Nagercoil -629 002, Kanyakumari(2017)
6. Dulsy Fatima and N. Arumugam. Immunology, Saras Publications, 114/35 G, A.R.P Camp Road, Periaivillai, Kottar PO, Nagercoil -629 002, Kanyakumari(2020)


Head of the Department

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Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc.,		Programme Title:	Bachelor of Zoology	
Course Code:	21UZY6E32		Title	Batch:	2021 – 2024
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	--	Semester:	VI
			Core Elective Paper – III Wildlife Conservation	Credits:	4

Course Objective

To acquire knowledge on forest types, biodiversity, wild life conservation and techniques deployed for conservation.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the importance of forest, wildlife conservation and its management techniques	K1
CO2	Understand the methods used in wildlife census	K2
CO3	Apply knowledge about conservation on Indian wildlife	K3
CO4	Analyze and estimate different animal population	K4
CO5	Acquire the knowledge about priorities in wildlife conservation	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	M	L	H	L	M	--	M	H	M
CO2	L	--	H	--	M	L	M	M	M
CO3	--	--	H	--	L	--	H	H	M
CO4	--	--	H	--	M	L	M	M	L
CO5	--	--	H	--	L	L	M	H	M

Units	Content	Hrs
Unit I	Scope and importance of Wildlife - Causes of wildlife depletion <i>Economic importance of wildlife*</i> - Need for wildlife conservation - Rare, endangered, threatened endemic species	15
Unit II	Forestry - Types in India- identification, dendrology; Deforestation & Impacts - Impact and removal of invasive alien species - Remote sensing in Forestry management.	15
Unit III	Wildlife Management Techniques - Vegetative analyses – Point Centered Quadrat, Quadrat, Strip transect - GIS and Remote sensing in wildlife habitat surveys- Wildlife Photography - Types of cameras, camera traps - Field equipments-altimeter, pedometer, field compass, binoculars; radio collaring; GPS	15
Unit IV	Wildlife Census Techniques - Total counts -Sample counts - Direct count -block count, transect methods, Point counts, visual encounter survey, waterhole survey - Indirect count -Call count, track and signs, pellet count, pugmark, camera	15

	trap,Capture-recapture techniques	
Unit V	• Conservation of Wildlife: in-situ and ex-situ conservation: ○ Wildlife Sanctuaries, and Parks*, ○ Tiger Reserves and Biosphere reserves: ○ Project: Tiger; Elephant ○ Role of Government and Non-Governmental organizations in conservation.	15
	Total contact hours	75

* denoted as self study topic

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Seminar, Quiz, Assignments, Group Task.

Text Book

1. K.V. Krishnamurthy An advanced text book on Biodiversity, principles, and practice, Oxford IBH Publishing company private limited, New Delhi. (2017).
2. Anne E Magurran. Ecological diversity and its measurement. Springer Netherlands. (1988)

Reference Books

1. P.K. Maiti and P.Maiti. Biodiversity perception, Peril, and Preservation. PHL Learning private Ltd., New Delhi. (2011)
2. D. Kar. Biodiversity Conservation prioritization. Swastik publications, New Delhi. (2010)
3. Prithipalsingh. An introduction to biodiversity . ANE Books India , New Delhi(2007)
4. Asish Ghosh. Natural resource conservation and environment management. APH Publishing Corporation, New Delhi(2003)
5. B.S. Badan and Harish Bhatt. Ecotourism. Commonwealth Publishers, New Delhi(2007)
6. K.P.Singh and J.S.Singh (EDS).. Tropical ecosystem, ecology and management. Willey eastern limited, New Delhi. (1991)


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Pollachi - 642 001, Coimbatore District.

Programme code:	B. Sc.,	Programme Title :	Zoology	
Course Code:	21UZY 6E33	Title	Batch :	2021-2024
		Core Elective Paper–III Dairy Farming and Management Technology	Semester	VI
Hrs/Week:	5		Credits:	4

Course Objectives

To provide recent knowledge of dairy farming, animal management and production

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember knowledge of dairy farming and milk product	K1
CO2	Deduce the Breeding practices in dairy farm	K2
CO3	Apply the knowledge in Production of condensed and dried milks	K3
CO4	Sort of the Food safety and quality assurance.	K4
CO5	Assess the knowledge nutritive value of milk.	K5

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	M	M	M	L	M	M	H	H	H
CO2	M	L	L	L	L	H	H	M	M
CO3	H	M	M	M	M	M	H	H	H
CO4	M	L	L	L	H	L	H	M	H
CO5	M	M	L	M	M	M	H	M	M

Units	Content	Hrs
Unit I	• Scope of dairy farming • Dairy progress in India • Milk production in India and Tamil Nadu • Nutritive value of milk * • By products of milk	15
Unit II	Analytical techniques in milk and milk products • Detection of Hypochlorites • Estimation of Chloramines • Test for presence of skimmed milk powder in Natural milk (Cow, buffalo, goat, sheep). • Alkaline phosphatase Test - Pasteurisation in Liquid Milk	15
Unit III	DAIRY HUSBANDRY • Dairy Cattle Breeds • Indigenous Breeds ○ Gir ○ RedSindhi ○ Sahiwal and Deoni	15

	- Exotic Breeds - Jersey - Holstein - Brown Swiss - Nutritive requirements of dairy cows - Maintanance of Health and Hygiene *	
Unit IV	DAIRY CHEMISTRY - Physical and chemical properties of milk - Structural elements of milk - Fat Globules - Casein Micelles - Globular Proteins - Environmental factors influencing the composition of milk DAIRY MICROBIOLOGY - Common microorganisms in milk - Spoilage of milk - Fermentation of milk - Milk borne diseases	15
Unit V	DAIRY PROCESSING AND TECHNOLOGY: - Dairy processing - Standardization - Pasteurization - Homogenization - Indigenous milk products	15
Total Contact Hrs		75

*- denoted as self study topic

Pedagogy

Direct Instruction, Digital Presentation
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Assessment Methods:

Seminar, Quiz, Assignments, Group Task.

Text Books

1. Banarjee G.C A Text book of Animal Husbandry S.CHAND Publications, Oxford & ibh Publishing Pvt. Ltd (1998).

Reference Books

1. Varnam, A., Sutherland, Jane P., Milk and Milk Products Technology, chemistry and microbiology publishers, Springer, U.S (1994).
2. Lampert., Modern Dairy Products Chemical Publishing Co Inc.,U.S.; 3 edition (1998)
3. Gupta P.R. Dairy India Year Book – (2007 b)
4. Schmidt G. H., Van vleek L. D. and Hutjens M. F. Principles of Dairy Science Subsequent edition (1988)
5. Eiri Board Handbook of Dairy Farming: To Produce Milk with Packaging Engineers India Research Institute (2008).
6. John L. Curtis Cattle Embryo Transfer Procedure Academic Press Inc (1992).

Programme Code:	B.Sc.,			Programme Title:	Bachelor of Zoology	
Course Code:	21UZY5E3			Title	Batch:	2021 – 2024
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	--	Core Elective Paper – I Haematology and Clinical pathology	Semester:	V
					Credits:	4

Course Objective

To understand the methods of blood analysis and laboratory diagnostics in clinical pathology.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the methods of blood analysis and disease diagnostics	K1
CO2	Understand the methods used in blood cells count and blood chemistry	K2
CO3	Apply knowledge about laboratory diagnosis	K3
CO4	Analyze and blood samples and organs diagnostics methods	K4
CO5	Acquire the knowledge about laboratory techniques	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	H	M	M	L	H	H	M	M	H
CO2	M	M	M	L	M	H	M	M	H
CO3	H	H	H	M	M	H	H	M	H
CO4	M	M	M	M	M	M	M	M	H
CO5	H	H	H	M	M	M	H	M	H

Units	Content	Hrs
Unit I	• Haematology ○ Blood Collection ○ Capillary Blood collection ○ Venous Blood collection ○ Anticoagulant- Ammonium & potassium Oxalate mixture • Clinical examination of blood ○ Blood smear Preparation ○ Staining of a thin blood film ○ Examination of stained film ○ Parasites seen in the blood ○ Bleeding time ○ Clotting time	12
Unit II	• Blood analysis • Estimation of Haemoglobin ○ Cyan methaemoglobin Photometric method ○ Haemoglobin estimation by sahli method ○ Haemoglobin estimation of the sample blood • Blood cell total count ○ Neubauer Counting chamber ○ Total RBC Count ○ Total WBC Count • Erythrocyte Sedimentation Rate (ESR) ○ Westergren's method ○ Windrobe method ○ Precautions ○ Interpretation	12
Unit III	• Blood Chemistry ○ <i>Blood samples for different Analysis*</i> • Blood Sugar ○ Methods for estimation of glucose ○ Glucose tolerance test ○ Two hour post prandial blood glucose ○ Oral Glucose tolerance test ○ Intra venous tolerance test • Cholesterol • Urea • Non protein Nitrogen in Blood	12

Unit IV	• Clinical Pathology Laboratory diagnosis of Various types of anaemias ○ Iron deficiency anaemia ○ Vitamin B12 deficiency anaemia • Liver Function tests ○ Normal functions of the Liver ○ Indications for Liver function tests ○ bilirubin metabolism ○ Estimation of Urine bilirubin ○ Estimation of Urine Urobilinogen	12
Unit V	• Laboratory diagnosis of jaundice ○ Bilirubin metabolism ○ Classification of Jaundice • Laboratory diagnosis of AIDS ○ Aetiology ○ Epidemiology ○ Pathogenesis ○ Transmission ○ Clinical diagnosis of AIDS ○ Prevention of HIV transmission in health care settings	12
	• Total contact Hours	60

**- denoted as self study topics*

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Seminar, Quiz, Assignments, Group Task.

Text Book

1. Dutta, A. Experimental Biology A laboratory manual. Narosa Publishing House, New Delhi. (2009)
2. Ramnik Sood, Medical Laboratory Techniques, 5th edition. Jaypee Brothers Medical publishers (P) Ltd. Delhi, . (1999)
3. Sachdev, K. N. Clinical pathology and bacteriology. Jaypee brothers- medical publishers, New Delhi(1999)

Reference Books

1. Vandana Puri, Praveen Kr Gupta. Complex review of Pathology and Haematology for NBE . 6th edition, CBS publishers, Delhi (2020).
1. Ajmani PS. Handbook of Clinical Laboratory Techniques . AITBS Publisher , India(2017)

2. Mukherjee. KL. Medical Laboratory Technology. Volume 1,2 and 3. Tata McGraw Hill education, India. (2010)
3. Talib VH, Khurana. Handbook of Medical Laboratory Technology , CBS publishers, Delhi(2009)
4. Varley H. Practical Clinical Biochemistry, CBS Publishers, Delhi (2008)
5. John Macleod and John Munro, Clinical Examination. ELBS publishers (1988)
6. Samuel, K. M. Notes on Clinical Lab Techniques. K. Gopalan publishers, Madras(1982)

Head of the Department

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Principal :-

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Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc.,			Programme Title:	Bachelor of Zoology	
Course Code:	21UZY5AL			Title	Batch:	2021 – 2024
Lecture Hrs./Week	--	Tutorial Hrs./Sem.	--	Advanced Learner Course -1 Bioinformatics	Semester:	V
					Credits:	5*

Course Objective

To study about the basic bioinformatics and its tools

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind the basic bioinformatic tools	K1
CO2	Comprehend the genomic study and sequence analysis	K2
CO3	Apply the basic knowledge of drug designing	K3
CO4	Sort the core principles of Bioinformatics	K4
CO5	Acquire knowledge about the phylogenetic analysis	K5

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	H	H	M	H	H	M	M	M	H
CO2	H	M	L	M	M	L	H	H	M
CO3	M	H	M	H	H	M	H	M	H
CO4	H	M	L	M	M	L	M	H	M
CO5	M	H	L	H	H	M	H	M	H

Units	Content	Hrs
Unit I	Scope of Bioinformatics	

	- Databases - Biological databases - Specialized databases - Protein sequence database – SWISS-PROT	
Unit II	- Symbols used in databases - Single letter code for nucleotides - Single letter code for aminoacids - Standard genetic codes used in Bioinformatics - PubMed – Hard link database connection - GenBank (Genetic sequence database)	
Unit III	Genomics - Classification and applications Proteomics - Classification and applications - Human genome project - Goals and techniques - Potential benefits	
Unit IV	- Bioinformatics tools - Significance of bioinformatic tools - Similarity tool : BLAST and FASTA - Visualizing tool : RasMol and Chime - Miscellaneous tool : Webcutter	
Unit V	- Virtual Library - Drug designing - Phylogenetic analysis - Construction of phylogenetic tree – PHYLIP (free online software) - Applications of phylogenetic analysis	
Total Contact Hrs		

Pedagogy and Assessment Methods: self study

Text Book

1. Sundaralingam R.& Kumaresan V - Bioinformatics , Saras Publication, 114/35G . A.R.P Camp road, Periaivillai, Kottar PO, Nagercoil, Kanyakumari - 2nd edition – (2012)

Reference Books

1. Ron Mansfield - Working in Microsoft office- McGraw-Hill Book Co, New York – (2009).
2. Rajaraman, V - Fundamentals of computer –Prentice Hall of India Pvt.Ltd, New Delhi -110001 – (1986).
3. Simminder Kaur Thukral -Bioinformatics-Orpita Bosu, Oxford University Press, New Delhi – (2007).
4. Attwood T.K. and Parrysmith D.J - Introduction to Bioinformatics - Addison Wesley Longman, Harlow -. (1999).
5. Fuelker , M.H. -Bioinformatics – Applications in Life and Environmental Sciences Capital Publishing Company, New Delhi –(2009).
6. Ignacimuthu, S. -Basic Bioinformatics –Narosa Publishing House, New Delhi – (2005).

7. Sharma, Munjal & Shankar - A text book of Bioinformatics – Rastogi Publications, Meerut, India- (2008)
8. Jin Xiong - Essential Bioinformatics - Cambridge University Press - (2006).
9. Subramanian C. - Genomic Bioinformatics- Dominant Publisher, New Delhi – (2010).

Head of the Department

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Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc.,			Programme Title:	Bachelor of Zoology	
Course Code:	21UZY6E6			Title	Batch:	2021 – 2024
				Core Elective - II	Semester:	VI
Lecture Hrs./Week	4	Tutorial Hrs./Sem	-	Parasitology	Credits:	4

Course Objectives

To study about the different parasites and diseases in human.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the diversity of parasites	K1
CO2	Comprehend the parasite-host relationship	K2
CO3	Apply Medical Importance of parasites	K3
CO4	Analyse the Life cycle of parasites	K4
CO5	Recollect the knowledge on parasitic diseases in human	K5

Mapping

PO / PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO									

CO1	L	L	L	M	L	M	H	L	H
CO2	L	M	L	L	M	L	M	M	H
CO3	M	M	M	M	M	M	H	L	M
CO4	L	M	L	L	M	L	M	M	H
CO5	M	L	M	M	L	M	H	L	M

Units	Content	Hrs
Unit I	• Scope of parasitology • Host parasitic relationship –Commensalism, Phoresis, Parasitism, Mutualism • Ecological aspects of parasitism • Minor Medical Importance of parasites	9
Unit II	• Effect of parasites on hosts Tissue damage – Hyperplasia, Hypertrophy, Metaplasia, Neoplasia. • Opportunistic parasites –<i>Toxoplasma gondii</i>, <i>Cryptosporidium parvum</i>, <i>Enterocytozoon bienersi</i>	9
Unit III	• <i>Locomotory organs of parasites*</i> • Encystation in parasites • Reproduction in parasites • Pathogenicity in human – <i>Naegleria fowleri</i>, <i>Acanthamoeba</i>	9
Unit IV	• pathogenicity ◦ Ciliates – <i>Balantidium coli</i> ◦ Flagellates – <i>Geardia lamblia</i> • Blood and Tissue Protistans - <i>Leishmania</i> and <i>Trypanasoma</i>	9
Unit V	• Nematode infection of human - <i>Enterobius vermicularis</i> and <i>Trichuris trichiura</i>. • Hookworm – <i>Ancylostoma duodenale</i> and <i>Trichinella spiralis</i> • Vector borne nematode - <i>Wuchereria bancrofti</i> • <i>Filarial nematode</i> – <i>Loa loa*</i>	9
	Total Contact Hrs	45

* denoted as self study topic

Pedagogy

Direct Instruction, Digital Presentation
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Assessment Methods:

Seminar, Quiz, Assignments, Group Task.

Text Book

1. Human parasitology-Burton J Bogtish – Academic Press, An Imprint of Elsevier – 5th Edition, (2019)

Reference Books

1. Loker, Eric S. and Bruce V.Hofkin - Parasitology: A Conceptual Approach, Garland Science, Taylor & Francis Group, New York and London.ISBN978-0-8153-4473-5 – (2015)
2. Desowitz, R.S. New Guinea Tapeworms and Jewish Grandmothers: Tales of Parasites and People, W.W. Norton and Company, New York.ISBN 978-0-393-30426-8 (1987)
3. Zimmer, C. Parasite Rex: Inside the Bizarre World of Nature's Most Dangerous Creatures, The Free Press, New York.ISBN 978-0-7432-0011-(2000)


Head of the Department

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Programme Code:	B.Sc.,			Programme Title:	Bachelor of Zoology	
Course Code:	21UZY6AL			Title	Batch:	2021 – 2024
				Advanced Learner Course- Immuno therapeutics	Semester:	VI
Lecture Hrs./Week	-	Tutorial Hrs./Sem.	--		Credits:	5*

Course Objective

To acquire the Knowledge of diseases and working mechanisms and test against infectious diseases.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the concepts of infections	K1
CO2	Understand the Knowledge about immunotechniques	K2
CO3	Analyse the diseases by diagnostic methods	K3

CO4	Deploy the biosynthesis of antibodies	K4
CO5	Assess the various tests used to detect the diseases	K5

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	M	L	M	L	H	H	M	M	H
CO2	M	M	L	L	M	H	M	M	H
CO3	L	M	M	M	M	H	H	M	H
CO4	M	M	M	M	M	M	M	M	H
CO5	M	M	M	M	M	M	H	M	H

Units	Content	Hrs
Unit I	Introduction ○ Infectious Disease Causing organisms ○ Types of Infection ○ Pathogen Escape Mechanisms ○ Immune response to Malaria ○ Plasmodium Escape Mechanism	
Unit II	Biosynthesis of Antibody • Site and Genetic control of Antibody • Mechanism of Biosynthesis of Antibody • Theories on Antibody Synthesis	
Unit III	Monoclonal Antibodies • Production of Monoclonal antibodies • Applications of Monoclonal antibodies* Transplantation Immunology • Types of Graft • Graft rejection • Mechanism of Allograft rejection	
Unit IV	Auto Immune Diseases • Characteristics of autoimmune diseases • Causes of autoimmune diseases • Pathogenesis of autoimmune disease • Diagnosis of autoimmune diseases • Treatment of autoimmune diseases	
Unit V	Immunotechniques • Double immunodiffusion • Radial immunodiffusion • Enzyme Linked Immuno sorbent Assay • VDRL Test for Syphilis • Widal Test • Well Felix Test	
	Total Contact Hrs	

**denoted as self study topics*

Pedagogy and Assessment Methods: Self Study

Text Book

1. Mani. A., Selvaraj. A.M., Narayanan, L. M. and Arumugam, N. Microbiology. Saras publications, 114/35 G, A.R.P Camp Road, Perivallai, Kottar PO, Nagercoil -629 002, Kanyakumari(2007)
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