



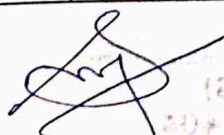
MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE(Autonomous) - Rasipuram - 637 408

Scheme of Examinations LOCF-CBCS Pattern

(for the Students Admitted from the Academic Year:2021-2022 Onwards)

B.Sc.ZOOLOGY

S.No.	PART	STUDY COMPONENTS	COURSE_CODE	TITLE OF THE COURSE	Hrs./W		CREDIT POINTS	MAX.MARKS		
					Lect.	Lab.		CIA	ESE	TOTAL
<b>SEMESTER - I</b>										
1	I	LANGUAGE-I	21M1UFTA01	TAMIL-I	5		3	25	75	100
2	II	LANGUAGE-II	21M1UCEN02	COMMUNICATIVE ENGLISH-I	5		3	25	75	100
3	III	DSC THEORY - I	21M1UZOC01	INVERTEBRATES	4		4	25	75	100
4	III	GEC THEORY - I	21M1UBOA01	ALLIED- BOTANY I	4		4	25	75	100
5	III	DSC PRACTICAL - I	21M2UZOP01	PRACTICAL : INVERTEBRATES AND CHORDATA	-	3				
6	III	GEC PRACTICAL - I	21M2UBOAP1	PRACTICAL : ALLIED BOTANY	-	3				
7	IV	AECC - VALUE EDUCATION	21M1UVED01	YOGA	2		2	100		
8	IV	PROFESSIONAL ENGLISH - I	21M1UPEL01	PROFESSIONAL ENGLISH FOR LIFE SCIENCE - I	4		2	25	75	100
				TOTAL	24	6	18	225	375	500
<b>SEMESTER - II</b>										
1	I	LANGUAGE - I	21M2UFTA02	TAMIL-II	5	-	3	25	75	100
2	II	LANGUAGE - II	21M2UCEN02	COMMUNICATIVE ENGLISH - II	5	-	3	25	75	100
3	III	DSC THEORY - II	21M2UZOC02	CHORDATA	4	-	5	25	75	100
4	III	GEC THEORY - II	21M2UBOA02	ALLIED -BOTANY II	4	-	3	40	60	100
5	III	DSC PRACTICAL - I	21M2UZOP01	PRACTICAL: INVERTEBRATES AND CHORDATA	-	3	3	40	60	100
6	III	GEC PRACTICAL - I	21M2UBOAP1	PRACTICAL: ALLIED BOTANY	-	3	3	40	60	100
7	IV	AECC - ENVIRONMENTAL STUDIES	21M2UEVS01	ENVIRONMENTAL STUDIES	2	-	2	100		
8	IV	PROFESSIONAL ENGLISH - II	21M2UPEL02	PROFESSIONAL ENGLISH FOR LIFE SCIENCE - II	4		2	25	75	100
				TOTAL	24	6	24	320	480	700

  
**HEAD**  
 Department of Zoology  
 Muthayammal College of Arts & Science  
 Rasipuram - 637 408, Namakkal (Dt.).  
 Tamilnadu, India.

  
**PRINCIPAL**  
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 (AUTONOMOUS)

**SEMESTER - III**

1	I	LANGUAGE - I	21M3UFTA03	TAMIL-III	5	-	3	25	75	100
2	II	LANGUAGE - II	21M3UCEN03	COMMUNICATIVE ENGLISH - III	5	-	3	25	75	100
3	III	DSC THEORY - III	21M3UZOC03	CELL AND MOLECULAR BIOLOGY	5	-	5	25	75	100
4	III	GEC THEORY - III	21M3UCHA01	ALLIED- CHEMISTRY I	4	-	4	25	75	100
5	III	DSC PRACTICAL - II	21M4UZOP02	PRACTICAL : GENETICS, CELL AND MOLECULAR BIOLOGY	-	3				
6	III	GEC PRACTICAL - II	21M4UCHAP1	PRACTICAL: ALLIED CHEMISTRY	-	3				
7	III	SEC - I	21M3UZOS01	SERICULTURE	3	-	2	25	75	100
8	IV	NMEC - I	21M3UBTN01/ 21M3UCSN02	NMEC - I	2	-	2	25	75	100
				TOTAL	24	6	19	150	450	600

**SEMESTER - IV**

1	I	LANGUAGE - I	21M4UFTA04	TAMIL-IV	5	-	3	25	75	100
2	II	LANGUAGE - II	21M4UCEN04	COMMUNICATIVE ENGLISH - IV	5	-	3	25	75	100
3	III	DSC THEORY - IV	21M4UZOC04	GENETICS	5	-	4	25	75	100
4	III	GEC THEORY - IV	21M4UCHA02	ALLIED-CHEMISTRY II	4	-	3	25	75	100
5	III	DSC PRACTICAL - II	21M4UZOP02	PRACTICAL: GENETICS, CELL AND MOLECULAR BIOLOGY		3	3	40	60	100
6	III	GEC PRACTICAL - II	21M4UCHAP1	PRACTICAL: ALLIED CHEMISTRY	-	3	3	40	60	100
7	IV	SEC - II	21M4UZOS02	DAIRY SCIENCE	3	-	2	25	75	100
8	IV	NMEC - II	21M4UBTN02/ 21M4UCSN03	NMEC - II	2	-	2	25	75	100
				TOTAL	24	6	23	230	570	800

  
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**NAMAKKAL DISTRICT.**

**SEMESTER - V**

1	III	DSC THEORY - V	21M5UZOC05	DEVELOPMENTAL BIOLOGY	5	-	5	25	75	100
2	III	DSC THEORY - VI	21M5UZOC06	ANIMAL PHYSIOLOGY	5	-	5	25	75	100
3	III	DSC THEORY - VII	21M5UZOC07	MICROBIOLOGY AND IMMUNOLOGY	4	-	4	25	75	100
4	III	DSC PRACTICAL - III	21M6UZOP03	PRACTICAL: DEVELOPMENTAL BIOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION	-	3				
5	III	DSC PRACTICAL - IV	21M6UZOP04	PRACTICAL: MICROBIOLOGY, IMMUNOLOGY AND ECOLOGY	-	3				
6	III	DSE - I	21M5UZOE01	ELECTIVE - I	4	-	4	25	75	100
7	III	DSE - II	21M5UZOE03	ELECTIVE - II	4	-	4	25	75	100
8	IV	SEC - III	21M5UZOS03	POULTRY SCIENCE-I	2		2	25	75	100
9	III	INTERNSHIP	21M5UZOIS1	INTERNSHIP	-	-	-	-	-	-
				<b>TOTAL</b>	<b>24</b>	<b>6</b>	<b>24</b>	<b>150</b>	<b>450</b>	<b>600</b>

**SEMESTER - VI**

1	III	DSC THEORY - VIII	21M6UZOC08	EVOLUTION	5	-	5	25	75	100
2	III	DSC THEORY - IX	21M6UZOC09	ECOLOGY	5	-	4	25	75	100
3	III	DSE - III	21M6UZOE04	ELECTIVE - III	4	-	4	25	75	100
4	III	DSE - IV	21M6UZOE05	ELECTIVE - IV	4	-	4	25	75	100
5	III	DSC PRACTICAL - III	21M6UZOP03	PRACTICAL: DEVELOPMENTAL BIOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION	-	3	3	40	60	100
6	III	DSC PRACTICAL - IV	21M6UZOP04	PRACTICAL: MICROBIOLOGY, IMMUNOLOGY AND ECOLOGY	-	3	3	40	60	100
7	III	PROJECT WORK	21M6UZOPR1	PROJECT WORK	-	4	4	40	60	100
8	III	ONLINE - COMPETITIVE EXAMINATION	21M6UZOOE1	COMPETITIVE ONLINE EXAMINATION IN OBJECTIVE ZOOLOGY	-	-	2	100		
9	IV	SEC - IV	21M6UZOS04	POULTRY SCIENCE-II	2	-	2	25	75	100
10	V	EXTENSION ACTIVITY	21M6UEXA01	EXTENSION ACTIVITY		-	1	100		
11		NAAN MUTHALVAN SCHEME			-	-	-	-	-	-
				<b>TOTAL</b>	<b>20</b>	<b>10</b>	<b>32</b>	<b>445</b>	<b>555</b>	<b>800</b>
				<b>OVERALL TOTAL</b>	<b>140</b>	<b>40</b>	<b>140</b>	<b>1520</b>	<b>2880</b>	<b>4000</b>
		EXTRA CREDIT COURSE	21M6UZOEC1	MOOC Courses offered in	-	-	2	-	-	-
		VALUE ADDED COURSE		Animal Husbandry	-	-	-	-	-	-

**HEAD**  
Department of Zoology

UNIVERSITY

**B.Sc.,-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M1UZOC01	INVERTEBRATES	DSC THEORY - I	I	4	4	0	0	4
<b>Objective</b>	To understand the habitat, adaptation, organization and taxonomic status of invertebrates and recall certain morphological attributes and physiological processes that are distinct and significant to each Phyla							
Unit	Course Content						Knowledge Levels	Sessions
<b>I</b>	<p><b>Phylum: Protozoa</b> Type Study: <i>Paramecium caudatum</i> –External features, Nutrition, Locomotion- effective stroke, recovery stroke, Metachronal rhythm, Reproduction-Asexual- Binary fission, Sexual reproduction –Conjugation, Autogamy, Endomixis, Hemimixis and Cytogamy. General Topic: Protozoan human diseases</p> <p><b>Phylum: Porifera</b> Type Study: <i>Leucosolenia botryoides</i>- External features- Body wall, Spicules, Nutrition, Reproduction. General Topic: Canal System in sponges.</p>						K1-K2	10
<b>II</b>	<p><b>Phylum: Coelenterata</b> Type Study: <i>Obelia geniculata</i> - External features- Histology of the colony, Cnidoblast and its functions, Life History of Obelia, Metagenesis. General Topic: Polymorphism in Coelenterates</p> <p><b>Phylum: Helminthes</b> Type Study: <i>Taenia solium</i>- External features- Body wall, Feeding, Respiratory system, Excretory system-flame cells, Nervous system, Reproductive system, Life cycle. General Topic: Parasitic adaptation in Helminthes.</p>						K1-K2	8
<b>III</b>	<p><b>Phylum: Annelida</b> Type Study: <i>Megascolex mauritii</i>- External features, Body wall, Coelom, Locomotion, Digestive system, Excretory system, Nervous system, Reproductive system. General Topic: Metamerism in annelids</p> <p><b>Phylum: Arthropoda</b> Type Study: <i>Macrobrachium rosenbergii</i>-External morphology, Appendages, Digestive system, Respiratory system, Reproductive system. General Topic: Larval forms of Crustacea</p>						K1 -K2	8
<b>IV</b>	<p><b>Phylum: Arthropoda</b> Type study: <i>Periplaneta americana</i> - External features, Body wall, Mouthparts, Digestive system, Respiratory system, Nervous system, Sense organs, Excretory system, Reproductive system. General Topic: Peripatus- Affinities as a living fossil,</p>						K1-K3	9

	Beneficial Insects.						
V	<p><b>Phylum: Mollusca</b>  Type Study: <i>Pila globosa</i>- External features, Shell, Digestive system, Respiratory system, Circulatory system, Nervous system, Sense organs- Eyes, Osphradium, Statocyst, Tentacles, Excretory system.  General Topic: Torsion in Mollusca.</p> <p><b>Phylum: Echinodermata</b>  Type Study: <i>Asterias rubens</i>- External features, Pedicellaria- Structure and Function, Digestive system, Water vascular system, Circulatory system-Perihaemal and Haemal system, Nervous system, Sense organs, Excretory system, Reproductive system.  General Topic: Larval forms of Echinoderms and their evolutionary significance.</p>		K1-K3	10			
Course Outcome	After completion of the course, students should be able to						
	CO1: Understand the habitat, adaptation, organization and taxonomic status of animal kingdom		K1				
	CO2: Classify the animalphyla based on their characteristics		K1				
	CO3: Distinguish the various internal anatomical structures and their functions		K2				
	CO4: Analyze the fundamental knowledge about on economic importance of animals		K3				
	CO5: Realize the importance of animal kingdom to our real life		K3				
<b>Learning Resources</b>							
Text Books	1. Jordan.E.L and Verma. P.S, Invertebrate Zoology Revised Edn., S.Chand and Co. Ltd. 2. Kotpal R.L (2011), Modern Text Book of Zoology – Invertebrates, Rastogi Publications.						
Reference Books	1.Ekambaranatha Ayyar, M.&Ananthakrishnan, T.N (2010 ) Manual of Zoology Vol-I (Invertebrata) Part I & II Vishwanathanpublication. 2. Dhami P.S. and Dhami J.K (2012), Invertebrate Zoology 5 th edition S. Chand & Co., New Delhi.						
Website Link	1. <a href="https://www.geeksforgeeks.org/coelenterata/">https://www.geeksforgeeks.org/coelenterata/</a> 2. <a href="https://bit.ly/3D12dFM">https://bit.ly/3D12dFM</a>						
	L-Lecture		T- Tutorial	P- Practical	C- Credit		

**B.Sc.,-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Se m	Hours	L	T	P	C
21MIUZOC01	INVERTEBRATES	DSC THEORY - I	I	4	4	0	0	4

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	L	M	S	M	S	M	M
CO2	S	L	M	M	M	S	S	S	M	L
CO3	S	L	M	L	L	S	S	S	L	M
CO4	S	S	M	S	S	S	M	S	S	M
CO5	S	M	S	M	S	S	S	S	M	M
Level of Correlation between CO and PO	L-LOW	M-MEDIUM		S-STRONG						

<b>Tutorial Schedule</b>	--
<b>Teaching and Learning Methods</b>	1. Lectures 2. Discussions 3. Interactive sessions 4. Presentation 5. Mind mapping 6. Field visit
<b>Assessment Methods</b>	1. Unit test 2. Assignment 3. Internal exam evaluation



Designed By	Verified By	Approved By

[Dr. D. SUGANYA]

[Dr. M. SURESH KUMAR]

**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UZOC02	CHORDATA	CORE THEORY - II	II	5	5	0	0	4

**Objective** To describe the taxonomic position, general characters, origin and the importance of different anatomical systems of chordates.

Unit	Course Content	Knowledge Levels	Sessions
I	<p><b>Introduction to Chordata:</b>                      General characters and Classification up to classes with the name of the examples. Prochordata: General characters and classification up to orders with the name of the examples.                      Type study: Amphioxus-External features-Digestive and Excretory system Agnatha: Petromyzon-External morphology; Ammocoetes Larva                      General topics: Retrogressive Metamorphosis in Ascidian.</p>	K1-K3	12
II	<p><b>Pisces:</b>                      General characters and classification up to sub-classes with the names of the examples.                      Type study: Scoliodon (shark) -External characters- Placoid scales-Digestive system-Respiratory system Receptor Organs-Urinogenital system.                      General topics: 1. Accessory respiratory organs in fishes 2. Migration of fishes</p>	K1-K2	12
III	<p><b>Amphibia: &amp; Reptiles</b>                      General characters and classification up to orders with the name of the example.                      Type study: Frog -structure and organisation (Excluding skeletal system) General topics: 1. Parental care in amphibia. Reptilia: General characters and classification - Type study - Calotes - structure and organisation (Excluding skeletal system)                      General Topics: 1. Identification of poisonous and non-poisonous snakes of South India 2. Poison apparatus-Biting mechanism- venom- First aid for snake bite- Antivenom.</p>	K1-K3	12
IV	<p><b>Aves:</b>                      General characters and classification up to subclasses with the names of the examples.                      Type study: Columba livia (Pigeon)-External characters-Flight muscles-Digestive system, Respiratory system, Urinogenital system                      General topics: 1. Migration of Birds 2. Flight adaptations in Birds</p>	K1-K3	12
V	<p><b>Mammalia:</b>                      General characters and classification up to subclasses with the names of the examples.                      Type study: Rabbit -External morphology - Digestive system - Respiratory system-Heart-Structure of Brain-Reproductive system.                      General topics: 1. Egg laying mammals 2. Adaptations of aquatic mammals 3. Dentition in mammals</p>	K1-K3	12

<b>Course Outcome</b>	After completion of the course, students should be able to		
	<b>CO1:</b> Understand the habitat, adaptation, organization and taxonomic status of chordates	K1-K3	
	<b>CO2:</b> Describe the unique characteristics of Urochordates, hemichordata and cephalochordates	K1-K2	
	<b>CO3:</b> Explain the anatomical functions of the chordates to mammals.	K1-K3	
	<b>CO4:</b> Acquire the knowledge about on ecological role in different groups of chordates.	K1-K3	
	<b>CO5:</b> Connect the importance of chordate to our real life	K1-K3	

<b>Learning Resources</b>	
<b>Text Books</b>	1. Jordan, E.L and P.S. Verma (1995). Chordate Zoology and Elements of Animal Physiology 10th editionn. S. Chand and Co. Ltd, New Delhi.
<b>Reference Books</b>	1. Ayyar, E.K and T.N. Ananthkrishnan (1992). Manual of Zoology, Vol II. (Chordata). S. Viswanathan Printers and Publishers. Ltd., Madras. 2. Nigam, H.C. (1983). Zoology of Chordates. Vishal Publ., Jalandhar.
<b>Website Link</b>	1. <a href="https://bit.ly/3TCxa8W">https://bit.ly/3TCxa8W</a> 2. <a href="https://bit.ly/3AGqe1U">https://bit.ly/3AGqe1U</a>

L-Lecture

T-  
Tutorial

P-  
Practical

C-Credit



**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UZOC02	CHORDATA	CORE THEORY - II	II	5	35	0	0	4

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	L	M	S	M	S	M	M
CO2	S	L	M	M	M	S	S	S	M	L
CO3	S	L	S	L	L	S	S	S	L	S
CO4	S	S	M	S	S	S	M	S	S	M
CO5	S	M	S	M	S	S	S	S	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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Tutorial Schedule	
Teaching and Learning Methods	1. Lectures 2. Discussions 3. Intractive sessions 4. Presentation 5. Mind mapping 6. Field visit
Assesment Methods	1. Unit test 2. Assignment 3. Internal exam evaluation

Designed By	Verified By	Approved By
Dr.D. SUGANYA	Dr.M.SureshKumar	A-h-5000



**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UZOP01	PRACTICAL: INVERTEBRATES AND CHORDATA	DSC PRACTICAL - I	II	3	0	0	3	3
<b>Objective</b>	To identify the anatomical characteristics of animals and classify of the ontogenic and phylogenic relationships of Invertebrates and phylum Chordata.							
S.No.	List of Experiments / Programmes						Knowle dge Levels	Sessions
1	<b>Cockroach:</b> 1. Digestive system 2. Nervous system						K1-K3	6
2	<b>Prawn:</b> 3. Nervous system						K1-K3	3
3	<b>Any BonyFish:</b> 4. Digestive system						K1-K3	3
4	<b>MOUNTING</b> a. Mouth parts of House fly, Honey bee, Mosquito b. Sting apparatus of Honey bee c. Scoliodon: Placoid scales.						K2	6
5	<b>Classify giving reasons up to order:</b> Paramecium, Aurelia, Fasciola, Ascaris, Lamellidens, Asterias, Balanoglossus, Herdmania (Ascidian), Branchiostoma (Amphioxus), Petromyzon, Scoliodonsorrakowah, Ranahexadactyla, Calotesversicolor, Columbalivia.						K1	3
6	<b>Draw labeled sketches:</b> Obelia medusa, Ephyra larva, Redia larva, Cercaria larva, Mysis larva, Alima larva, Bipinnaria larva Amphioxus- T.S.throughpharynx. Doliolum, Salpa, Narcine, Cynoglossus, Alcedoatthis(King-fisher)						K1	3
7	<b>Comment on Biological significance:</b> Plasmodium, Obelia colony, Physalia, Velella, Fasciola - Miracidium, Taenia - Mature proglottid, Trochophore larva, Chaetopterus, Peripatus, Hirudinaria, Limulus, Chiton, Sepia, Octopus, Tornarialarva, Ascidian Tadpole larva, Anabass candens, Clarias batrachus, Hippocampus, Echeneis, Ichthyophis, Axolotlelarva, Chamaeleon, Viperarusselli(Russel'sviper), Dracovolans, Dinopium(Woodpecker), Bat.						K1	3

8	<b>Comment on Structure / Skeleton / Palate / Dentition:</b> Sponge - Spicules, Sponge - Gemmule, Taenia - Scolex, Neanthes - Parapodium, Penaeus - Petasma, Scorpion - Book lung, Starfish - Pedicellaria, Rana- Pectoralgirdle, Rana- Pelvic girdle, Pigeon-Palate, Rabbit-Dentition.	K1	3
<b>Course Outcome</b>	After completion of the course, students should be able to		30
	CO1: Understand the practical knowledge on animal structures	K1	
	CO2: Classify the ontogenic and phylogenic relationships of animal kingdom	K2	
	CO3: Know the biological significance of various animals	K3	
	CO4: Interpret the structure of various animals anatomy	K3	
	CO5: Catagorize the various economically important animals for their self employment	K3	
<b>Learning Resources</b>			
<b>Text Books</b>	1. Practical Zoology- Invertebrates S.S. Lal, Rastogi publication, 7th Edition. 2. Manual of practical Zoology ,PS Verma, S CHAND Publication, 5th Edition		
<b>Reference Books</b>	1. Barnes, R. S. K (1982). Invertebrate Zoology, IV Edition. Holt Saunders International Edition. 2. Verma. P.S. 2011 A Manual of Practical Zoology Invertebrates, Chand & Co, Ltd, 5th Edition		
<b>Website Link</b>	1. <a href="https://bit.ly/3etEa70">https://bit.ly/3etEa70</a> 2. <a href="https://bit.ly/3Qc039d">https://bit.ly/3Qc039d</a>		

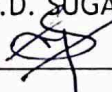
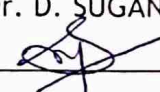

## B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UZOP01	PRACTICAL: INVERTEBRATES AND CHORDATA	DSC PRACTICAL - I	II	3	0		3	3

### CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	L	M	S	S	S	M	S
CO2	S	M	S	S	S	S	S	S	M	M
CO3	S	L	M	L	M	S	S	M	L	M
CO4	S	L	M	L	M	S	S	S	M	M
CO5	S	M	M	M	M	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW	M-MEDIUM		S-STRONG						

<b>Tutorial Schedule</b>	1. Chart explanation
<b>Teaching and Learning Methods</b>	1. Practical demonstration 2. Virtual Dissections 2. Observations of specimens 3. Virtual Dissections
<b>Assessment Methods</b>	1. Model practical's 2. Observation 2. Record 3. Observation

Designed By	Verified By	Approved By
Dr.D. SUGANYA 	Dr. D. SUGANYA 	



**B.Sc.,-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UZOC 03	CELL AND MOLECULAR BIOLOGY	DSC THEORY - III	III	5	5			4
<b>Objective</b>	To analyze the structures and functions of basic components of cells and its molecular mechanism							
<b>Unit</b>	<b>Course Content</b>						<b>Knowledge Levels</b>	<b>Sessions</b>
<b>I</b>	Introduction- Cell-Discovery of cell-Cell theory- Principles of microscopes-Types- Light, Phase contrast, Electron microscopes, Cytological techniques - cell fractionation- Homogenization- Centrifugation- Isolation of Sub-cellular components. Tissue Culture and Cell Culture Techniques.						K1	12
<b>II</b>	Ultra structure of animal & Plant cell – Cytoplasm – Physical, chemical and biological properties. Structure, composition and functions: Golgi complex, Lysosomes, Ribosomes, Plasma Membrane-Models, Endoplasmic reticulum, centrioles, plastids, cytoskeleton.						K2	12
<b>III</b>	Ultra Structure, chemical composition and functions: Mitochondria, Nucleus, Nucleolus, Chromosome-Heterochromatin, Euchromatin						K3	12
<b>IV</b>	Nucleic acids: DNA & RNA Ultrastructure & Types. Replication-Transcription- Translation- Principles of gene regulation, concept of operons, lac operon concept						K2-K3	12
<b>V</b>	Cell cycle and cell division: Amitosis, Mitosis and meiosis and their significance. Cancer biology –Properties of cancer cells, carcinogenesis. Aging – Cell death and apoptosis.						K2-K3	12
<b>Course Outcome</b>	After completion of the course, students should be able to							
	<b>CO1:</b> Understand and appreciate the basic components of the cells and its observation tools						K1	
	<b>CO2:</b> Outline the structure and functions of cell organelles						K1	
	<b>CO3:</b> Analyze the ultra-structure and chemical composition of cell organelles						K2	
	<b>CO4:</b> Differentiate the structure and functions of DNA, RNA and its regulations						K3	
<b>CO5:</b> Evaluate the formation of cancer cells and its properties						K3		
<b>Learning Resources</b>								
<b>Text Books</b>	1.DE Robertis E.D.P (2017) Cell and Molecular Biology, 8th Edition, Wolfe Publication							
<b>Reference Books</b>	1. W.H. Freeman & Co. Lodish& (1999) Molecular Cell Biology, New York 2. Rastogi. S.C. (2008) Cell and Molecular Biology, 2nd Edition, New Age International (p) Ltd., New Delhi.							
<b>Website Link</b>	1. <a href="https://bit.ly/3cLjOqe">https://bit.ly/3cLjOqe</a> 2. <a href="https://bit.ly/3KN5ABO">https://bit.ly/3KN5ABO</a> 3. <a href="https://bit.ly/3BdNgyt">https://bit.ly/3BdNgyt</a>							
	L-Lecture			T-Tutorial	P-Practical	C-Credit		

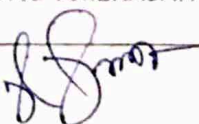

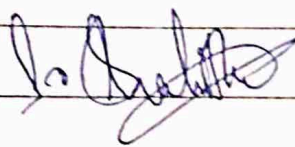
**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

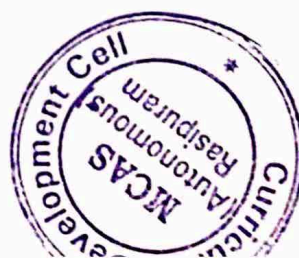
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UZ OC03	CELL AND MOLECULAR BIOLOGY	DSC THEORY - III	III	5	5			4

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	L	S	S	S	L	M
CO2	M	L	M	L	M	S	S	M	L	M
CO3	S	M	M	L	M	S	S	S	M	M
CO4	S	M	S	M	L	S	S	S	M	S
CO5	M	L	M	M	M	M	S	S	M	S
Level of Correlation between CO and PO	L- LOW	M-MEDIUM		S- STRONG						

<b>Tutorial Schedule</b>	
<b>Teaching and Learning Methods</b>	1. Lectures 2. Discussions 3. Interactive sessions 4. Presentation 5. Mind mapping 6. Field visit
<b>Assessment Methods</b>	1. Unit test 2. Assignment 3. Internal exam evaluation

Designed By	Verified By	Approved By
Dr. D AMERASAN 	Dr. D. SUGANYA 	



**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C	
21M4UZOC04	GENETICS	DSC THEORY - IV	IV	5	5	0	0	4	
<b>Objective</b>	To state the basic principles and concepts of genetics, gene interactions and patterns of inheritance								
Unit	Course Content							Knowledge Levels	Sessions
I	Introduction to genetics - Basis of Mendelian Inheritance and Mendelian Laws -Non Mendelian inheritance-Interaction of Genes - Complementary Factors, Inhibitory and lethal Factors, Atavism.							K1	9
II	Multiple Alleles: Definition, ABO blood groups and Rh factor in Human, Genetic Problems. Pedigree analysis - Symbols used and problems associated with autosomal recessive disorder, autosomal dominant disorder, Sex linked inheritance (X and Y).							K2-K3	8
III	Linkage and crossing over: Drosophila -T. H. Morgan's Experiments - Cytological Evidence for Crossing Over. Sex determination and sex linkage in Drosophila and Man.							K3	10
IV	Non-Disjunction and Gynandromorphs - Cytoplasmic Inheritance-Maternal effect on Limnaea peregra [shell coiling], Fine Structure of Gene - Cistron -Recon, Muton - Gene Regulation - Operon concept - Lac Operon.							K2	8
V	Mutation: Types- chromosomal Aberrations - examples from Human. Applied Genetics - Animal Breeding - Heterosis, Inbreeding, out breeding, Out Crossing, Hybrid Vigour. Population Genetics: Hardy Weinberg Law - factors affecting Hardy Weinberg Law.							K2 -K3	10
<b>Course Outcome</b>	After completion of the course, students should be able to								
	CO1: Acquire the basic information on principles and concepts of genetics							K1	
	CO2: Explain the various genetic disorders and inheritance through pedigree analysis							K2	
	CO3: Describe the mutation, applied genetics and population genetics in various aspects							K3	
	CO4: Apply the mutational effects on genetic materials							K2	
	CO5: Analyze the genetic variations through population genetics							K3	
Learning Resources									
<b>Text Books</b>	1. Verma, P.S. and Agarwal,V.K. (1995) Genectis, 8th edition, S. Chand & Co, New Delhi								





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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UZOP02	PRACTICAL : GENETICS, CELL AND MOLECULAR BIOLOGY	DSC PRACTICAL - II	IV	3	0	0	3	3

**Objective** To provide the practical skills in cell and molecular biology

S. No.	List of Experiments / Programmes	Knowledge Levels	Ses sions
1	Identification of Human Blood cells	K1-K2	4
2	Isolation of DNA from human blood sample	K2-K3	4
3	Squash preparation of grasshopper testis (Meiosis)	K1-K2	4
4	Observation of Polytene chromosome using Chironomous larva	K1-K2	3
5	Identification of Barr body using Buccal Smear preparation	K2-K3	4
6	Squash preparation of onion root tip (Mitosis)	K1-K2	3
7	Blood grouping	K1-K2	3
8	Columnar Epithelium, Ciliated epithelium, Glandular Epithelium. Cartilage T.S., Bone T.S. Cardiac Muscle, Striated muscle, Non Striated muscle, Neuron, C.S of mammalian Testis and Ovary, PCR, ELISA. AGE and PAGE	K1-K2	5

Course Outcome	After completion of the course, students should be able to	
	CO1:Understand the different techniques of Cell biology	K1
	CO2:Observation of different phases of cells	K2
	CO3: Develop the comprehensive understanding DNA	K3
	CO4:Demonstrate the working principles of bioinstruments	K3
	CO5: Apply knowledge of modern techniques in cell an molecular biology	K3

**Learning Resources**

<b>Text Books</b>	1.Celis JE (ed) (1998) Cell Biology: A Laboratory Handbook, 2nd edn. San Diego: Academic Press.
<b>Reference Books</b>	1. Paddock SW (ed) (1999) Methods in Molecular Biology, vol 122: Confocal Microscopy Methods and Protocols. Totowa, NJ: Humana Press 2. Alberts and Bruce (2004) "Essential Cell Biology", 2nd Edition, Garland Science,
<b>Website Link</b>	1. <a href="https://bit.ly/3RgJrhV">https://bit.ly/3RgJrhV</a> 2. <a href="https://bit.ly/3ASVBWW">https://bit.ly/3ASVBWW</a> 3. <a href="https://bit.ly/3qdnwMA">https://bit.ly/3qdnwMA</a>

L-Lecture      T-Tutorial                      P-Practical                      C-Credit



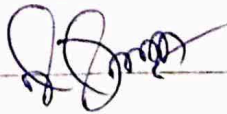

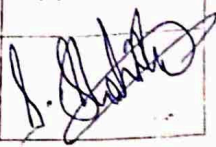
**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UZOP0 2	PRACTICAL : GENETICS, CELL AND MOLECULAR BIOLOGY	DSC PRACTICAL - II	IV	3	0	0	3	3

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	L	M	M	S	M	S	L	S
CO2	S	L	S	M	M	S	S	S	M	M
CO3	S	M	L	M	S	S	S	S	M	M
CO4	S	M	L	M	M	S	S	S	M	S
CO5	S	L	M	M	S	S	S	S	S	M
Level of Correlation between CO and PO	L-LOW	M-MEDIUM		S-STRONG						

Tutorial Schedule	1. Chart explanation
Teaching and Learning Methods	1. Practical demonstration 2. Virtual Dissections 3. Chart explanation 4. Observations of specimens
Assesment Methods	1. Model practical's 2. Observation 3. Record

Designed By	Verified By	Approved By
Dr. D. AMERASAN 	Dr. D. SUGANYA 	



**B.Sc., Zoology Syllabus LOCF- CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOC05	DEVELOPMENTAL BIOLOGY	DSC THEORY - V	V	5	5	0	0	5

**Objective** To understand the concept of fertilization and development of organs

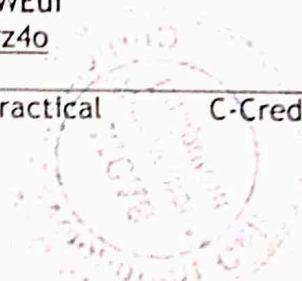
Unit	Course Content	Knowledge Levels	Sessions
I	Origin of Gametes - Spermatogenesis and Oogenesis in Amphibians and Mammal - Viability of gamete cells - Influence of yolk - Polarity - Symmetry - Egg membranes.	K1-K2	10
II	Fertilization - Process of fertilization - Theories of fertilization - Parthenogenesis: Natural - Artificial - Experiments on artificial parthenogenesis and its findings.	K1-K3	8
III	Embryonic Development - General Principle -, Cleavage in chick and frog, blastulation, gastrulation and morula. Experimental works of Spemann - Factors influencing cleavage - Fate map.	K2 -K3	8
IV	Organs Development - Development of brain, eye and ear in frog - Embryonic Adaptations: Embryonic membranes and their functions - Placentation in mammals. Regeneration: regeneration in invertebrates and vertebrates.	K3	9
V	Human Reproduction - Puberty - Menstrual cycle - Menopause - Pregnancy and related problems - Parturition - Lactation - Contraception - its merits and family welfare. Reproductive Technology (IUSI) - Intracytoplasmic sperm injection (ICSI)- Artificial insemination - Cryopreservation - IVF - Embryo transfer.	K3	10

Course Outcome	After the completion of course, students will be able	
	CO1: To understand the gamete formation, embryonic development and their principle experimental models	K1-K2
	CO2: To acquire knowledge about the fertilization process and its types	K1-K3
	CO3: To define the basic principles of early embryonic stages	K2 -K3
	CO4: To understand the development of organs and regeneration process	K3
	CO5: To acquire knowledge on human and animal reproductive technologies	K3

**Learning Resources**

<b>Text Books</b>	1. Verma, P.S., Agarwal, V.K. and Tyagi, B.S. 1995. Chordate Embryology. S.Chand & Co., New Delhi. 2. Balinsky, B.I. and Fabian, B.C.(2012) An Introduction to Embryology. Saunders College Publishing Company, Philadelphia.
<b>Reference Books</b>	1. Nelson, O.E. 1953. Comparative Embryology of the Vertebrates, Tata McGraw-Hill Book company, Inc., New York. 2. Majumdar, N.N. 1990. Textbook of Vertebrate Embryology. Tata McGraw-Hill Publishing Company, India.
<b>Website Links</b>	1. <a href="https://bit.ly/3mpWEui">https://bit.ly/3mpWEui</a> 2. <a href="https://bit.ly/3nMrz4o">https://bit.ly/3nMrz4o</a>

L-Lecture      T-Tutorial      P-Practical      C-Credit



**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOC05	DEVELOPMENTAL BIOLOGY	DSC THEORY - V	V	5	5	0	0	5

**CO-PO Mapping**

CO No.	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	L	M	S	M	S	M	M
CO2	S	L	M	M	M	S	S	S	M	L
CO3	S	M	S	L	M	S	M	S	M	M
CO4	S	S	M	S	S	S	M	S	S	M
CO5	S	M	S	M	S	S	S	S	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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Tutorial Schedule	
Teaching and Learning Methods	<ol style="list-style-type: none"> <li>Lectures</li> <li>Discussions</li> <li>Interactive sessions</li> <li>Presentation</li> <li>Mind mapping</li> <li>Field visit</li> </ol>
Assessment Methods	<ol style="list-style-type: none"> <li>Unit test</li> <li>Assignment</li> <li>Internal exam evaluation</li> </ol>

Designed By	Verified By	Approved By
Dr.V.VINITA VINJOY JERUSHA <i>Vita Vinjoy LV</i>	Dr.D.SUGANYA <i>[Signature]</i>	<i>[Signature]</i>



*(Dr.S. Srinivasan)*

**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOC06	ANIMAL PHYSIOLOGY	DSC THEORY - VI	V	5	5	0	0	5

**Objective** To gain knowledge about the organs of animals and their physiological functions

Unit	Course Content	Knowledge Levels	Sessions
I	<b>Nutrition</b> -Food types, Minerals & Vitamins - their deficiency. Digestive enzymes-Carbohydrate, Protein & Fat, Structure and function of digestive system in man, Digestion in man.	K1	10
II	<b>Circulation</b> - Blood composition, Origin and conduction of heart beat in man - Blood pressure, Blood clotting. <b>Excretion</b> - Classification of excretory products - structure of the mammalian kidney and urine formation.	K1-K2	8
III	<b>Respiration</b> - classification of Respiratory pigments- structure of haemoglobin, Transportation of gases - Bohr effect - Regulation of respiration - bronchitis, asthma - Physiological effects of smoking. Osmoregulation in Fishes - Osmoconformers, Osmoregulators.	K2-K3	8
IV	Effectors - Muscles - Types of muscles - ultra structure of skeletal muscle - Chemical composition and Physiology of Muscle contraction actin and myosin - Kymograph.	K3	9
V	Hormones-Endocrine glands Structure and functions - Pituitary, Thyroid, Islets of Langerhans, Adrenal, and Gonadial Hormone in man - Testis and Ovary.	K3	10
<b>Course Outcome</b>	After the completion of course, students will be able to		
	CO1: Gain knowledge about nutrition, enzymes and their mechanisms	K1	
	CO2: Acquire knowledge about the mammalian internal functions	K1-K2	
	CO3: Explain about the metabolic cycles and its importance	K2- K3	
	CO4: List out the muscle types and its physiological functions	K3	
	CO5: Get more knowledge about the endocrine organs and their functions	K3	

**Learning Resources**

<b>Text Books</b>	1. Verma, P.S., Tyagi, B.S. and Agarwal, V.K. 2010. Animal Physiology. Reprint edition. S. Chand & Co. Publisher, New Delhi.
<b>Reference Books</b>	1. Hoar, W.S. 1975. General and Comparative Physiology. Prentice Hall, Publication, Hoboken, New Jersey. 2. Hill, R.W. 2012. Animal physiology. 3 <sup>rd</sup> edition. Sinauer Associates Inc. Publication, U.S.
<b>Website Links</b>	1. <a href="https://bit.ly/2KKlhKx">https://bit.ly/2KKlhKx</a> 2. <a href="https://bit.ly/3mIS8x1">https://bit.ly/3mIS8x1</a>

L-Lecture      T-Tutorial      P-Practical      C-Credit

**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOC06	ANIMAL PHYSIOLOGY	DSC THEORY - VI	V	5	5	0	0	5

**CO-PO Mapping**

CO. No.	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	L	M	S	S	S	M	M
CO2	S	M	M	M	M	S	S	S	M	L
CO3	S	M	S	M	L	S	S	S	M	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	S	M	S	M	S	S	S	S	M	S
Level of Correlation between CO and PO	L-LOW			M-MEDIUM			S-STRONG			

<b>Tutorial Schedule</b>	<ol style="list-style-type: none"> <li>Interactive sessions</li> <li>Quiz</li> </ol>
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>Lectures</li> <li>Discussions</li> <li>Presentation</li> <li>Mind mapping</li> <li>Field visit</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>Unit</li> <li>Assignment</li> <li>Internal exam evaluation</li> </ol>

<b>Designed By</b>	<b>Verified By</b>	<b>Approved By</b>
Dr. V. VINITA VINJOY JERUSHA Vita Vinjoy L V	Dr. D. SUGANYA	<i>[Signature]</i>



**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOC07	MICROBIOLOGY AND IMMUNOLOGY	DSC THEORY - VII	V	4	4	0	0	4

**Objective** To gain knowledge about the fundamentals of microorganism, immunology and their related diseases

Unit	Course Content	Knowledge Levels	Sessions
I	Outline Five Kingdom, Ultrastructure of Protozoa, Bacteria, Virus and Fungi. Scope of Microbiology. Systematic position of Virus - classification - Structure of bacteriophage. Viroids and Prions. Ultra structure of E. coli. General structure of fungi.	K1	12
II	Sterilisation- Types of sterilization, Types of Culture medium - Culture of Bacteria -Bacterial growth and growth curve - factors influencing bacterial growth. Maintenance & Characteristics of colonies. Staining of bacteria-simple and gram staining	K1-K2	8
III	Preservation of Milk -Microbes in Food Spoilage. Culture of Yeast & economic importance. Microbial Nitrogen fixation - Stages - types and methods of fermentation& products. Basic concepts of Probiotics. Bacterial (Cholera, Typhoid), Viral (Rabies, HIV) & Fungal (Candidiasis, Dandruff) diseases in man.	K2	10
IV	Lymphoid organs & Cells of immune system - Types of Immunity - immune response - immunoglobulin - Structure of IgG. Epitopes, Paratopes, Haptens & Adjuvants. Antigen antibody reactions - T-Cell and B-Cell activation - Monoclonal antibodies.	K2-K3	8
V	Basic concepts of major histocompatibility complex. - Basic properties and functions of Cytokines, Interferons and complement proteins. Types of hyper sensitivity. Concepts of autoimmunity and immunodeficiency - Vaccines& Immunisation	K1-K3	12
<b>Course Outcome</b>	After the completion of course, students will be able to		
	CO1: Understand the fundamental concept of immunity	K1	
	CO2: Acquire knowledge about the contribution of the organs and cells in immune response	K1-K2	
	CO3: Gain the knowledge about various microorganisms	K2	
	CO4: Understand the industrial application of microbiology	K2-K3	
	CO5: Understand the immunological disorders and microbial disease	K1-K3	

**Learning Resources**

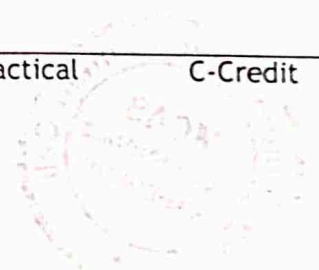
<b>Text Books</b>	1. Verma, P.S., Tyagi, B.S. and Agarwal, V.K. 2010. Animal Physiology. Reprint edition. S. Chand & Co. Publisher, New Delhi.
<b>Reference Books</b>	1. Hoar, W.S. 1975. General and Comparative Physiology. Prentice Hall, Publication, Hoboken, New Jersey. 2. Hill, R.W. 2012. Animal physiology. 3 <sup>rd</sup> edition. Sinauer Associates Inc. Publication, U.S.
<b>Website Links</b>	1. <a href="https://bit.ly/2KKlhKx">https://bit.ly/2KKlhKx</a> 2. <a href="https://bit.ly/3mLS8x1">https://bit.ly/3mLS8x1</a>

L-Lecture

T-Tutorial

P-Practical

C-Credit



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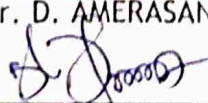
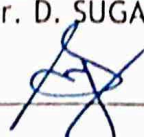
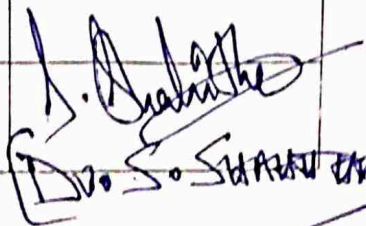
Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOC07	MICROBIOLOGY AND IMMUNOLOGY	DSC THEORY - VII	V	4	4	0	0	4

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	L	S	S	S	L	M
CO2	S	L	M	L	M	S	S	M	L	M
CO3	S	M	M	M	M	S	S	S	S	M
CO4	S	M	S	M	M	S	S	S	M	S
CO5	M	L	M	M	M	M	S	M	M	S
Level of Correlation between CO and PO		L-LOW			M-MEDIUM			S-STRONG		

**Tutorial Schedule**

<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Discussions</li> <li>3. Interactive sessions</li> <li>4. Presentation</li> <li>5. Mind mapping</li> <li>6. Field visit</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>1. Unit test</li> <li>2. Assignment</li> <li>3. Internal exam evaluation</li> </ol>

Designed By	Verified By	Approved By
Dr. D. AMERASAN 	Dr. D. SUGANYA 	 Dr. S. SANKAR





**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M6UZOC08	EVOLUTION	DSC THEORY - VIII	VI	5	5	0	0	5

<b>Objective</b>	To gain knowledge about the origin of life and the evolution of man							
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Unit	Course Content	Knowledge Levels	Sessions
I	Concept of Evolution, Origin of Life, Origin of basic biological molecules, concept of Oparin - Haldane, Miller-Urey Experiment, Origin of Prokaryotes and Eukaryotes.	K1-K2	10
II	Evidences of Evolution, Analogy and Homology, Embryological, Physiology and Biochemical Evidences of Evolution, and Molecular Phylogeny. Distribution of animals	K1-K2	10
III	Lamarckism and Neo Lamarckism, Darwinism and Neo Darwinism. Modern synthetic theory, Salient features and principles	K2 -K3	10
IV	Natural selection Theory - concept of Species and Speciation. Isolating mechanism, Hardy-Weinberg Law.	K3	10
V	Fossils, Adaptation and adaptive radiation. Darwin finches. Polymorphism - types and significance. Role of extinction in evolution, Causes and effects of extinction, Origin and evolution of man	K3	10

<b>Course Outcome</b>	After the completion of course, students will be able to		
	CO1: Understand the theories of life	K1-K2	
	CO2: Gain knowledge about the evolution of species	K1-K2	
	CO3: Understand the spontaneous theories of evolution	K2 -K3	
	CO4: Explain the modern theories of origin of life	K3	
	CO5: Gain knowledge about the behavior and tertiary evolution	K3	

**Learning Resources**

<b>Text Books</b>	1. Rostogi, V.B. Organic Evolution, Kedernath, Ramnath publishers, Meerut.
<b>Reference Books</b>	1. Arumugam N (2009) A text book of Evolution - Saras Publication Delhi 2. Verma P.S. & Agarval, V.L. concepts of evolution S.Chand & Company
<b>Website Link</b>	1. <a href="https://bit.ly/3Lg8Vev">https://bit.ly/3Lg8Vev</a> 2. <a href="https://bit.ly/40knzWl">https://bit.ly/40knzWl</a>

L-Lecture    T-Tutorial    P-Practical    C-Credit

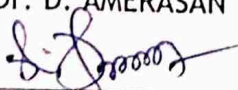

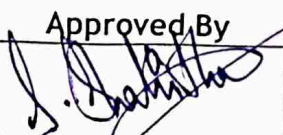
**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M6UZOC08	EVOLUTION	DSC THEORY - VIII	VI	5	5	0	0	5

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	L	L	S	M	S	S	M
CO2	S	L	S	M	M	S	S	S	M	L
CO3	S	M	S	L	S	S	M	S	M	S
CO4	S	S	M	S	S	M	M	S	S	M
CO5	S	M	S	M	S	S	S	S	M	M
Level of Correlation between CO and PO	L-LOW	M-MEDIUM		S-STRONG						

Tutorial Schedule	
Teaching and Learning Methods	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Discussions</li> <li>3. Interactive sessions</li> <li>4. Presentation</li> <li>5. Mind mapping</li> <li>6. Field visit</li> </ol>
Assessment Methods	<ol style="list-style-type: none"> <li>1. Unit test</li> <li>2. Assignment</li> <li>3. Internal exam evaluation</li> </ol>

Designed By Dr. D. AMERASAN	Verified By Dr. D. SUGANYA	Approved By
		



*(Handwritten signature)*  
Dr. S. Suganya

**B.Sc., - Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hou rs	L	T	P	C
21M6UZOC09	ECOLOGY	DSC THEORY - IX	VI	5	3	2	0	4
<b>Objective</b>	To understand the distribution of biotic and abiotic factors of living things in the environment.							
<b>Unit</b>	<b>Course Content</b>						<b>Knowl edge Levels</b>	<b>Sessio ns</b>
I	Man and the Environment - Abiotic factors-Limiting factors, sources and biological effects of Temperature, Light and Water. Biotic factors of the environment.						K1-K2	10
II	Community Ecology: Population - characteristics - Density, Natality, Mortality and age distribution, Age pyramids. Community - structure, stratification, components, Ecotone and edge effect, Ecological niche. Food chain and Food web.						K1-K3	10
III	Ecosystem - Pond as an ecosystem - Energy flow and ecological succession. Biogeochemical cycle - Carbon, Nitrogen, Phosphorous. Animal relationship - Neutralism, Symbiosis and Antagonism.						K1-K3	10
IV	Habitats - Fresh water, Marine, estuary and Terrestrial. Environmental Pollutions - Sources, impact and prevention of Air, Water, Soil and noise pollution. Solid waste management through vermiculture.						K1-K3	10
V	Natural resources- renewable and non renewable. Forest resources- Wildlife Protection Act - Chipko movement - Afforestation. Wild life management- Biodiversity, Wild life sanctuaries and National Parks.						K1-K3	12
<b>Course Outcome</b>	After the completion of course, students will be able to							
	CO1: Understand the relationship between man and environment						K1-K2	
	CO2: Acquire knowledge on Community Ecology						K1-K3	
	CO3: Recite ecosystem and biogeochemical cycles						K1-K3	
	CO4: Interpret different kinds of habitats and pollutions						K1-K3	
	CO5: Explain the natural resources and wildlife management						K1-K3	
<b>Learning Resources</b>								
<b>Text Books</b>	<ol style="list-style-type: none"> <li>1. Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Company, Phil. London.</li> <li>2. Abdul ahad, M. and Anas Ferdous, A.S.M. 2019. A Textbook of Ecology. Himachal Publication, Bishal Book Complex, Banglabazar, Dhaka</li> </ol>							
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Kotpal, R.L. and Bali, N.P. 1986. Concepts of Ecology, Vishal Publication, New Delhi.</li> <li>2. Sharma, B.K. and Kaur. 1997. An Introduction to Environmental Pollution. Goel Publishing House, Meerut.</li> </ol>							
<b>Website Link</b>	<ol style="list-style-type: none"> <li>1. <a href="https://bit.ly/3LrI5RT">https://bit.ly/3LrI5RT</a></li> <li>2. <a href="https://bit.ly/41EQZ2S">https://bit.ly/41EQZ2S</a></li> </ol>							

L-Lecture T-Tutorial P-Practical C-Credit

**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOC09	ECOLOGY	DSC THEORY - IX	VI	5	3	2	0	4

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	L	M	M	S	S	M	S
CO2	S	S	S	M	S	S	S	M	S	M
CO3	M	M	S	S	S	L	L	S	S	S
CO4	S	S	M	S	S	S	S	M	M	S
CO5	L	S	S	S	L	S	S	S	S	M

Level of Correlation between CO and PO

L-LOW

M-MEDIUM

S-STRONG

**Tutorial Schedule**

*1. PPT - Student Seminar*

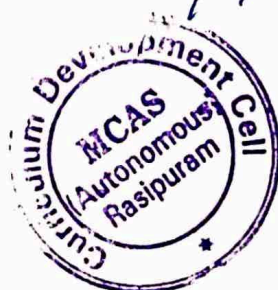
**Teaching and Learning Methods**

1. Lectures
2. Discussions
3. Interactive sessions
4. Presentation
5. Mind mapping
6. Field visit

**Assessment Methods**

1. Unit test
2. Assignment
3. Internal exam evaluation

Designed By	Verified By	Approved By
Dr. M. PRABU <i>M. Prabu</i>	Dr. D. SUGANYA <i>[Signature]</i>	<i>[Signature]</i> Dr. S. SHANTHINI



**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M6UZOP04	MICROBIOLOGY, IMMUNOLOGY AND ECOLOGY	DSC PRACTICAL - IV	VI	3	0	0	3	3
Objective	To equip the students with the practical knowledge of the microbial, immunological and ecological techniques							
Unit	Course Content	Knowledge Levels	Sessions					
I	<b>MAJOR PRACTICALS:</b> Isolation and identification of microorganism Gram Staining Antigen-antibody test	K1	9					
II	<b>MINOR PRACTICALS:</b> 1. Serial dilution techniques. 2. Pasteurisation of milk 3. Methylene blue reductase test. 4. Report on a visit to National Park/Biodiversity Park/Wild life sanctuary	K2-K3	8					
III	Slides and spotters Microbiology-Identification of medically important pathogenic Protozoa - <i>Entamoeba histolytica</i> and <i>Plasmodium vivax</i> , bacteria - <i>Staphylococci</i> and <i>salmonella</i> , Fungi- <i>Aspergillus</i> , Virus - Corona virus and Poxvirus Immunology-Elisa, Electrophoresis (AGE and PAGE). Ecology-Identification of zooplankton and phytoplankton- Jellyfish, Krill, Amphipod, comb jelly, Green algae, Cyanobacterium, Seaweeds and Cryptomonads. Submission of Field Visit Report. Submission of Practical Record.	K3	10					
Course Outcome	After the completion of course students will be able to							
	CO1: Gain knowledge of electrophoresis	K1						
	CO2: Gain knowledge about aquatic ecosystem	K1						
	CO3: Understand the differential count and serial dilution techniques	K2-k3						
	CO4: Gain knowledge about microbiology and immunology	K3						
	CO5: Present an overview of ecology	K3						
Learning Resources								
Text Books	Ananthanarayan and Paniker (2020 )Textbook of microbiology, Eleventh Edition, Universities Press							
Reference Books	1. Talwar G.P. and Gupta S.K (2012) A Handbook Of Practical And Clinical Immunology , CBS PUBLICATION							
Website Link	❖ <a href="https://bit.ly/3VX1AEE">https://bit.ly/3VX1AEE</a> <a href="https://bit.ly/3I31fdw">https://bit.ly/3I31fdw</a>							

**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M6UZOP04	MICROBIOLOGY, IMMUNOLOGY AND ECOLOGY	DSC PRACTICAL - IV	VI	3	0	0	3	3

**CO-PO Mapping**

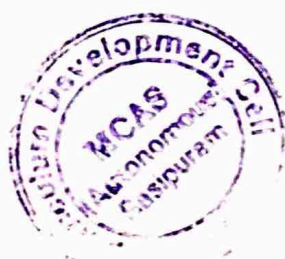
CO No.	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	M	S	S	S	M	M
CO2	S	M	M	M	M	S	S	S	M	M
CO3	S	M	S	M	M	S	S	S	M	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	S	M	S	M	S	S	S	S	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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<b>Tutorial Schedule</b>	<ol style="list-style-type: none"> <li>Interactive sessions</li> <li>Quiz</li> </ol>
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>Practical Demonstration</li> <li>Virtual dissection</li> <li>Chart explanation</li> <li>Observation of specimen</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>Model Practical</li> <li>Observation</li> <li>Records</li> </ol>

Designed By	Verified By	Approved By
DR. V. VINITA VINJOY JERUSHA <i>V. Vinjoy</i>	Dr. D. SUGANYA <i>[Signature]</i>	<i>[Signature]</i>

*(Dr. S. S. S. S. S.)*



**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 Onwards**

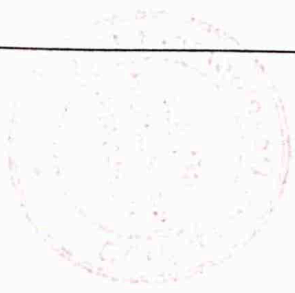
Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOP03	DEVELOPMENTAL BIOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION	DSC PRACTICAL - III	VI	3	0	0	3	3

**Objective** To provide the students knowledge of embryonic development and physiology analysis.

Unit	Course Content	Knowledge Levels	Sessions
I	<b>MAJOR PRACTICAL</b> ❖ Reproductive system of cockroach ❖ Estimation of the rate of O <sub>2</sub> consumption in fish. ❖ Qualitative analysis of carbohydrates, proteins, and fats.	K1-K2	9
II	<b>MINOR PRACTICALS:</b> ❖ Estimation of urine sugar. Bleeding time. Clotting time. ❖ Effect of pH and Temperature on salivary amylase activity. ❖ Study of fossils from models/ pictures.	K1-K2	8
III	<b>Spotters</b> ❖ Developmental Biology: Different Developmental Stages of Chick Embryos (24, 48, 72, 96 hours), Slides of blastula and gastrula of frog ❖ Physiology- Goat Heart, Goat lung, Goat liver. ❖ Evolution - Fossils - <i>Peripatus</i> and <i>Coelacanth</i> fish ❖ Submission of Field Visit Report ❖ Submission of Practical Record	K1-K3	10
<b>Course Outcome</b>	After the completion of course, students should be able to		
	CO1: Gain knowledge of the reproductive system of the insects	K1	
	CO2: Gain knowledge about oxygen consumption	K2	
	CO3: Learn about the bleeding time and clotting time	K3	
	CO4: Gain knowledge about the fossils	K2	
	CO5: Explain the physiology of various organs	K3	

**Learning Resources**

<b>Text Books</b>	1. Rastogi S. C. (2007) Essentials of Animal Physiology, New Age International
<b>Reference Books</b>	1. Paperback, B.D. Singh, Tripurari Mishra, R.K. Pandey (2022) Biochemistry and Physiology of Animal with Practical, Ram Prasad Publication
<b>Website Link</b>	❖ <a href="https://bit.ly/3UnLCm2">https://bit.ly/3UnLCm2</a> ❖ <a href="https://bit.ly/2Ha0Jbr">https://bit.ly/2Ha0Jbr</a>



**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOP03	DEVELOPMENTAL BIOLOGY, PHYSIOLOGY AND EVOLUTION	DSC PRACTICAL - III	VI	3	0	0	3	3

**CO-PO Mapping**

CO No.	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	M	S	S	S	M	M
CO2	S	M	M	M	M	S	S	S	M	M
CO3	S	M	S	M	M	S	S	S	M	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	S	M	S	M	S	S	S	S	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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<b>Tutorial Schedule</b>	1. Chart explanation
<b>Teaching and Learning Methods</b>	1. Practical Demonstration 2. Virtual dissection 3. Chart explanation 4. Observation of specimen
<b>Assessment Methods</b>	1. Model Practical 2. Observation 3. Records

<b>Designed By</b>	<b>Verified By</b>	<b>Approved By</b>
Dr. V. VINITA VINJOY JERUSHA <i>Vita Vinoy</i>	Dr. D. SUGANYA <i>[Signature]</i>	<i>[Signature]</i>

*[Signature]*  
**Dr. S. SHARATHA**





**Allied Course for any Degree offered by the B.Sc., Zoology  
LOCF-CBCS Pattern  
EFFECTIVE FROM THE ACADEMIC YEAR 2021-2022 Onwards  
LIST OF GEC - ALLIED COURSES**

S.No.	Sem	COURSE_CODE	TITLE OF THE COURSE
1	I	21M1UBOA01	ALLIED-BOTANY I
2		21M2UBOAP1	PRACTICAL: ALLIED BOTANY
3	II	21M2UBOA02	ALLIED- BOTANY II
4	II	21M2UBOAP1	PRACTICAL: ALLIED BOTANY
5	III	21M3UCHA01	ALLIED: CHEMISTRY-I
6		21M4UCHAP1	PRACTICAL: ALLIED CHEMISTRY
7	IV	21M4UCHA02	ALLIED: CHEMISTRY-II
8	IV	21M4UCHAP1	PRACTICAL: ALLIED CHEMISTRY

**B.Sc.-ZOOLOGY**  
**ALLIED BOTANY-I- Syllabus**  
**LOCF-CBCS with effect from 2022-2023 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21MIUBOA01	ALLIED BOTANY-I	GEC THEORY - I	I	4	3	2	0	4
Objective	Understand the Microbial diversity and learn the structure and life cycle of Bacteria, Viruses, Algae, Fungi, Bryophytes, pteridophytes and Gymnosperms. Learn about ecological adaptations and plant pathology.							
Unit	Course Content				Knowledge Levels	Sessions		
I	Microbiology: Types of microbes, General characters of Bacteria, Ultra-structure and Shape of Bacteria, Economic importance of Bacteria. General Character of viruses. Structure of T2 and TMV.				K1,K2	8		
II	Thallophytes: General Character of Algae and Blue green algae. Structure and life cycle of the following genera-oscillatoria, Oedogonium, Sargassam. Economic importance of algae.				K1,K2,K3	8		
III	Fungi- General Characters. Structure and life cycle of following genera Albugo, Penicillium and Agaricus. Economic importance of fungi.				K1,K2,K3	8		
IV	Bryophytes: General Characters. Structure and lifecycle of Marchantia and Polytrichum. Pteridophytes: General Characters Structure and lifecycle of Lycopodium .Gymnosperms: General Characters, Structure and lifecycle Cyas.				K1-K4	10		
V	Plant Ecology: Morphological and Anatomical adaptations in Hydrophytes and Xerophytes. Plant pathology- Plant pathogen-Symptoms-Control management, Tikka disease in groundnut, Citrus canker and Mosaic disease.				K1-K4	11		
Course Outcome	CO1: Get an overview recalling relevant knowledge from microbial diversity and understanding the structure of Bacteria and viruses.				K1			
	CO2: Understand the life cycle of different types of Algae and applying its economic importance.				K2			
	CO3: Summarize the life cycle of various fungus and demonstrate its economic importance.				K3			
	CO4: Analyse the life cycle of Bryophytes, Pteridophytes and Gymnosperms.				K4			
	CO5: Differentiate the Hydrophytes and Xerophytes adaptations and able to illustrate plant diseases.				K4			

## Learning Resources

**Text Books**

- 1) Vashishta, B.R., Sinha, A.K AND Singh, V.P (2008) Botany for Degree Students: Algae. S.Chand & Company Ltd., New Delhi.
- 2) Pandey, B.P. (2001) College Botany Vol.I: Algae, Fungi, Bacteria, Viruses, Plant pathology S.Chand & Company Ltd, New Delhi.

**Reference Books**

- 1) Sharma O P (1989) Text Book of Fungi. Tata McGraw Hill, New York.
- 2) Smith, G.M (1995) Cryptogamic Botany Vol.II Bryophytes and Pteridophytes (2nd Edn). Tata McGraw Hill Publishing Co., New Delhi.

**Website Link**

[https://swayam.gov.in/nd2\\_cec20\\_bt11/preview](https://swayam.gov.in/nd2_cec20_bt11/preview) <https://www.swayam>  
<https://www.swayamprabha.gov.in/index.php/program/archive/9>

L-Lecture

T-Tutorial

P-Practical

C-Credit

11  
11

B.Sc. Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M1UBA01	ALLIED BOTANY-I	ALLIED THEORY - I	I	4	3	2	0	4

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	M	S	S	S	S	S
CO2	S	S	M	M	L	S	S	S	S	S
CO3	S	S	M	M	L	S	S	S	S	S
CO4	S	S	M	M	L	L	L	L	L	M
CO5	S	S	M	M	L	L	L	L	L	L

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule: FIELD VISIT, GREEN HOUSE GARDEN VISIT, COLLECTING SPECIMENS AND INTERACTION

Teaching and Learning Methods: Chalk and Talk, visual and practical learning, classroom experiments, local field trips.

Assessment Methods: Unit Test, CIA, ESE

Designed by: Verified by: Approved by:

Dr. A.K.SARAVANAN

A. K. Saravanan



**B.Sc-ZOOLOGY-ALLIED BOTANY-II- Syllabus LOCF-CBCS with effect from 2022-2023 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UBOA02	ALLIED BOTANY-II	GEC THEORY - II	II	4	3	2	0	4
<b>Objective</b>	Get good knowledge about descriptive terms used in Taxonomy and Understand the characters of dicot and monocot plant families with their economic importance and also learn about photosynthesis, internal structure of stem, leaf and root. Overview of Embryology.							
<b>Unit</b>	<b>Course Content</b>						<b>Knowledge Levels</b>	<b>Sessions</b>
I	Morphology of Plant: Structure of the plants, Phyllotaxy, Types of leaf - Simple and Compound- Inflorescence- Floral parts - Racemose, Cymose & Special Types. Fruit - Types.						K1,K2	8
II	Taxonomy : Bentham and Hooker's system of classification, Study of the following families and their economic importance - Leguminosae, Acanthaceae, Cucurbitaceae, Asteraceae, Rubiaceae, and Poaceae.						K1,K2,K3,K4	7
III	Anatomy: Meristem -Types, Simple and Complex Tissues - Xylem and Phloem, Internal structure of Dicot stem, Dicot root, Dicot Leaf (Mesophytic only) Genetics: Mendel's law, Mono hybrid and Dihybrid cross.						K1,K2	8
IV	Plant Physiology: Osmosis, Absorption of water - Active and Passive, Photosynthesis - Light and Dark reactions (Calvin cycle), Transpiration- Stomatal movement, Plant Hormones types - Physiological effects of Auxin. Nitrogen cycle.						K1-K3	11
V	Embryology - Structure of anther, Development of male gametophyte. Structure of ovule and female gametophyte (Polygonum type). Fertilization. Structure and development of dicot embryo (Capsella bursa-pastoris).						K1-K3	11
<b>Course Outcome</b>	CO1: Get an overview recalling relevant knowledge from plant morphology and understanding the types of leaf and inflorescence.						K1	
	CO2: Understand and Summarize the various plant families and demonstrate its economic importance.						K2	
	CO3: Gain knowledge and differentiate the internal structure of stem, leaf and root.						K3	
	CO5: Students can understand the anther and ovule, structure and development, pollination & fertilization.						K3	
	CO4: Students can interpret photosynthesis, water absorption and plant hormones and apply osmosis principle						K4	
<b>Learning Resources</b>								
<b>Text Books</b>	1) Pandey.B.P(1991)Plant Anatomy(4th Edition) S.Chand & Company Ltd., New Delhi. 2) Verma V(2007)Text Book of Plant Physiology, Ane Books India, New Delhi.							

Reference Books	1) Pandey.B.P(1999) Taxonomy of Angiosperms, S.Chand & Company Ltd., New Delhi.				
Website Link	<a href="https://swayam.gov.in/nd2_cec20_bt11/preview">https://swayam.gov.in/nd2_cec20_bt11/preview</a> <a href="https://www.swayam">https://www.swayam</a> <a href="https://www.swayamprabha.gov.in/index.php/program/archive/9">https://www.swayamprabha.gov.in/index.php/program/archive/9</a> <a href="http://virtualplant.ru.ac.za/Main/ANATOMY/prac5.htm">http://virtualplant.ru.ac.za/Main/ANATOMY/prac5.htm</a> <a href="http://www.google.com/search?q=neela+bakore+reproduction+in+flowering+plants">http://www.google.com/search?q=neela+bakore+reproduction+in+flowering+plants</a>				
	L-Lecture	T-Tutorial	P-Practical	C-Credit	

CO-PO Mapping										
CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	M	S	S	S	S	L
CO2	S	S	M	M	L	S	S	S	S	L
CO3	S	S	M	M	L	S	S	S	S	M
CO4	S	S	M	M	L	M	M	M	M	M
CO5	S	S	M	M	L	S	S	M	M	L
Level of Correlation between CO and PO				L-LOW		M-MEDIUM		S-STRONG		
Tutorial Schedule				UNIT-I and II:FIELD VISIT, GREEN HOUSE GARDEN VISIT, COLLECTING SPECIMENS AND INTERACTION						
Teaching and Learning Methods				Chalk and Talk, visual and practical learning, classroom experiments, local field trips.						
Assessment Methods				Unit test, CIA, ESE						
Designed By						Verified By		Approved By		
Dr. A .K .SARAVANAN						A. h. bann		A. h. bann		



### Learning Resources

**Text Books**

- 1) Subramaniyan, N.S. (1999). Laboratory Manual of Plant Taxonomy (2nd Ed.). Tata McGraw-Hill Publishing Co., New Delhi.
- 2) Ashok Bendre (2011) A Text Book Of Practical Botany 2 Rastogi Publications-Meerut .

**Reference Books**

- 1) Foster, A.S. (1960). Practical Plant Anatomy. Van Nostrand and East-West Press, New Delhi. Ashok Kumar .

**Website Link**

<https://www.youtube.com/watch?v=lgIhKWBN1gc>

**ALLIED BOTANY PRACTICAL QUESTION MODEL**

1. Refer A & B to their families giving reasons (Diagrams not necessary) (2\*5=10 Mark)
2. Write the name of the family, Binomial name and morphology of the part used for C, D, E, F and G. (5\*2=10 marks)
3. Cut transverse section of H & I. Stain and mount in Glycerin. Identify & giving reasons. Draw diagrams. Submit the slides for valuation. (2\*5=10 marks)
4. Spotters: Write critical notes on J, K, L, M. Draw diagrams. (4\*3=12 marks)
5. Micro preparation of slides-Algae and Fungi (N and O). (2\*4=8marks)
6. Record (10marks)

**KEY**

1. For A and B - Any 2 plants prescribed in the syllabus. Reasons 3, Identification -2 (2 x 5 = 10 marks)
2. For C, D, E, F and G - any 5 specimens given in the practical syllabus. (5X2=10 marks)
3. For H and I - Identification-1, Slide -2 Diagram with label-1 Reason-1 (2 x 5= 10 marks)
4. For J, K, L, M. (4 x 3= 12 marks)(Identification -1, Diagram with notes-2) J- Algae & Fungi, K-Bryophytes & Pteridophytes, L-Plant Ecology & pathology, M- Plant Physiology Experiment.
5. For N and O - Identification -1, Slide preparation-3

**ALLIED BOTANY PRACTICAL QUESTION MODEL**



CO-PO Mapping										
CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	L	S	S	S	S	S
CO2	S	S	M	M	M	S	S	S	S	S
CO3	S	S	M	M	M	S	M	S	S	M
CO4	S	S	M	M	M	S	M	M	M	S
CO5	S	S	M	M	M	S	M	M	M	S
Level of Correlation between CO and PO					L-LOW			M-MEDIUM		S-STRONG
Tutorial Schedule										
Teaching and Learning Methods					Demonstration, encourage students to develop higher-order thinking skills (Applying, analyzing, evaluating, and creating). Every student has to speak and share their personal opinions.					
Assessment Methods					Individual performance assessment, Practical Examination.					
Designed By						Verified By			Approved By	
Dr. A.K.SARAVANAN						A. h. b. s. a. n. a. n.			A. h. b. s. a. n. a. n.	





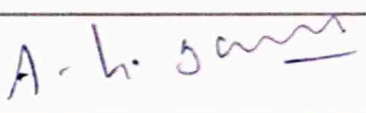


**B.Sc-Computer Science Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	P
21M2UBOAP1	ALLIED BOTANY PRACTICAL-I	GEC Practical-I	II	3	0	3
<b>Objective</b>	Understand the characters of monocot and dicot plant families, gain knowledge on internal structure of various plant parts and learn economic Botany.					
<b>S.No.</b>	<b>List of Experiments / Programmes</b>					<b>Knowledge Levels</b>
1	1. To describe in technical terms plants belonging to any of the families prescribed and Identify the family.					K1-K6
2	2. To identify the plant family and morphology of the parts used for the following plant Specimens. (Economic Botany) 1. Arachis hypogea- Ground nut 2. Dolichos biflorus - Horse gram 3. <i>Cicer arietinum</i> - Bengal gram 4. Phaseolus mungo - Black gram 5. Phaseolus radiatus-Greengram 6. Tamarindus indica - Fruit 7. Acacia concinna- Soapnut 8. Luffa aegyptiaca- Fibrous skeleton of the fruit 9. Cucumis sativus - Fruit 10. Coffea arabica - Seeds 11. Ixora coccinia - Flower 12. Oryza sativa -seeds 13. Triticum aestivum- seeds 14. Saccharum officinarum- Edible Stem 15. Adhatoda vesica- Leaves are used for making cough syrup. 16. Crossandra infundibuliformis-ornamental plant					K2
3	3. To make suitable Micro preparations, describe and identify materials of Algae(Oedogonium, Oscillatoria), Fungi (Penicillium), Bryophytes(Marchantia thallus C.S) Pteridophytes (Lycopodium stem C.S), Gymnosperms (Cycas leaflet C.S, Rachis C.S) and Angiosperms (Dicot stem, dicot leaf, dicot root) prescribed.					K4-K6
4	4. To demonstrate Bacterial morphology: Simple staining procedure using curd.(Demonstration only)					K4
<b>Course Outcome</b>	CO1: Get a good knowledge about the characters of plants and its classification.					K2
	CO2: Differentiate the plant parts based on the anatomical studies.					K3
	CO3: Understand the economic Botany.					K3
	CO4: Apply and analyze the micro preparation of Algae and Fungi and learn the morphology structure.					K4
	CO5: Students are able to determine and identify the new plant family.					K5

Level of Correlation between CO and PO	L- LOW	M- MEDIUM	S- STRONG
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Tutorial Schedule	
Teaching and Learning Methods	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Discussions</li> <li>3. Interactive sessions</li> <li>4. Presentation</li> <li>5. Mind mapping</li> <li>6. Field visit</li> </ol>
Assessment Methods	<ol style="list-style-type: none"> <li>1. Unit test</li> <li>2. Assignment</li> <li>3. Internal exam evaluation</li> </ol>

Designed By	Verified By	Approved By
Dr.D. SUGANYA 	Dr. M. SURESHKUMAR 	



**Allied Course for any Degree offered by the B.Sc., Zoology  
LOCF-CBCS Pattern  
EFFECTIVE FROM THE ACADEMIC YEAR 2021-2022 Onwards  
LIST OF GEC - ALLIED COURSES**

S.No.	SEM	COURSE_COD	TITLE OF THE COURSE
1	I	21M1UZOA01	ALLIED ZOOLOGY-I
2	II	21M2UZOA02	ALLIED ZOOLOGY-II
3	II	21M2UZOAP1	PRACTICAL : ALLIED ZOOLOGY PRACTICALS

**List of Allied Courses Offered to Chemistry Department  
B.Sc Zoology Syllabus LOCF-CBCS with effect from 2022-2023 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M1UZ OA01	ALLIED ZOOLOGY-I	GEC THEORY - I	I	4	4			4
<b>Objective</b>	To describe the economical importance of agro - based industries like Vermiculture, Lac culture and Apiculture							
<b>Unit</b>	<b>Course Content</b>						<b>Knowledge Levels</b>	<b>Sessions</b>
I	Basic Zoology : Brief Introduction about Classification of Animals - Organization level of classification- Importance of Animals for Human welfare						K1	10
II	Vermitechnology Introduction of Vermitechnology - Types of earthworms-Vermicompost method - small and large scale method, Vermiwash - methods						K1- K2	10
III	Lac culture Introduction to Lac culture- Harvesting of Lac- extraction of Lac-Processing of Lac- Commercial values of Lac						K3	11
IV	Apiculture Introduction of apiculture - Species of Honey Bee- Bee colony-Maintenance of honey bees - Methods of honey collection						K1-K2	7
V	Economic importance of vermiproducs - Bee products-Lac products						K3	7
<b>Course Outcome</b>	After completion of the course, students should be able to							
	CO1: Analyze the basic knowledge about on overall zoological branches						K1	
	CO2: Explain the methods of vermiculture, vermiwash and vermicompost						K1- K2	
	CO3: Understand the knowledge on Lac processing and its importance						K3	
	CO4: Compare the various types of honey bees and the rearing techniques						K1-K2	
	CO5: Apply the knowledge for self employment						K3	
<b>Learning Resources</b>								
<b>Text Books</b>	1. Mary Violet Christy, A (2008) Vermitechnology, MJP Publication. 2. David B.V (1988) Elements of Economic Entomology, Fourth Edition, Popular Publication. 3. Dev Bhattacharya( 2017) Economic Zoology, First Edition, WAVE Publication.							
<b>Reference Books</b>	1. Director. Zoological Survey of India, (1994), Earthworms Resources and Vermiculture 2. Edwards, C.A and Lofty, J.R. (1972). Biology of Earthworms (Chapman and Hall Ltd. London)							
<b>Website Link</b>	1. <a href="https://bit.ly/3wVEfrg">https://bit.ly/3wVEfrg</a> . 2. <a href="https://bit.ly/3BfYumq">https://bit.ly/3BfYumq</a>							

L-Lecture T-Tutorial P-Practical C-Credit

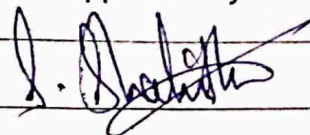
**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M1UZOAO1	ALLIED ZOOLOGY-I	GEC THEORY - I	I	4	4			4

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	L	M	S	S	S	M	S
CO2	S	L	M	L	S	S	S	S	M	S
CO3	S	S	M	S	S	S	S	S	M	S
CO4	S	M	S	M	S	S	S	S	S	S
CO5	S	S	M	L	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG							

Tutorial Schedule	
Teaching and Learning Methods	1. Lectures 2. Discussions 3. Intractive sessions 4. Presentation 5. Mind mapping 6. Field visit
Assessment Methods	1. Unit test 2. Assignment 3. Internal exam evaluation

Designed By	Verified By	Approved By
Dr.D.Amaresan	Dr.D. SUGANYA	



**List of Allied Courses Offered to Chemistry Department  
B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2022-2023 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
M2UZOAO 02	ALLIED ZOOLOGY-II	GEC THEORY - II	II	4	4			4
<b>Objective</b>	To understand the fundamental knowledge of dairy science, poultry science, aquaculture rearing techniques and its economic importance							
Unit	Course Content						Knowledge Levels	Sessions
I	<b>Dairy science</b> Introduction of dairy science - Dairy breeds of India and its classification - Exotic cow breeds - Jersey and Red sindhi. Indian breeds - Kangayam, Buffalo - Murrah. Milk - Composition - Nutritive value and Pasteurization of milk. Milk products - Butter, Ghee, Cheese.						K1-K3	10
II	<b>Poultry Science</b> Introduction of poultry science - Hatchery, Poultry feed management, Meat type such as Broilers, Egg type such as White Leghorn and Commercial layers, Dual purpose varieties and Processing of Egg, Meat and By-Products of Poultry.						K1-K2	10
III	<b>Aquaculture</b> Introduction of aquaculture - Breeding and culture of fresh water fishes - Catla, Mrigala, Rohu and Tilapia. Mari culture - pearl oyster, mussels, sea urchins, sea Cucumbers. Processing & preservation techniques of fishes						K1-K3	11
IV	<b>Sericulture</b> Introduction of sericulture - types of silkworms- Physical and commercial characters of cocoons. Reeling operations, importance of by-products of Sericulture						K1-K3	7
V	Economic importance of dairy product, poultry product, fish & fish products and silk.						K3	7
<b>Course Outcome</b>	After completion of the course, students should be able to							
	CO1: Analyze the basic concepts about dairy, poultry and aquacultue						K1-K3	
	CO2: Describe the techniques of household rearing animals like chicks, cows, Buffalos and fish						K1-K2	
	CO3: Explain the maintenance of silkworm, harvesting of silk						K1-K3	
	CO4:Relate the knowledge on dairy, poultry and aquacultue by-products						K1-K3	

	CO5: Apply the knowledge to the field level studies and become the entrepreneur	K3	
<b>Learning Resources</b>			
<b>Text Books</b>	1. Surekha M Gupta, 2010, Text Book of Fishery, ANE Publication. 2. Nilotpal Ghosh, 2015, Poultry Science and Practice, First Edition, CBS Publication. 3. C. Ganamani, Poultry Keeping, Tamil Puthagalayam Publication. 4. G. Ganga, Introduction to Sericulture, Second Edition, Oxford Publication		
<b>Reference Books</b>	1. Arora, D. R and Arora, B. (2001). Medical Parasitology. II Edition. CBS Publications and Distributors. 2. Dennis, H. (2009). Agricultural Entomology. Timber Press (OR).		
<b>Website Link</b>	1. <a href="https://bit.ly/3wVXy3V">https://bit.ly/3wVXy3V</a> . 2. <a href="https://bit.ly/3cKBCBR">https://bit.ly/3cKBCBR</a>		

L-Lecture      T-Tutorial      P-Practical      C-Credit

**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

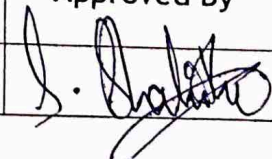
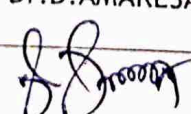
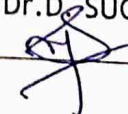
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UZOAO 02	ALLIED ZOOLOGY-II	GEC THEORY -II	I	4	4			4

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	S	S	M	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	S	S	L	S	S	S	S	M	S
CO4	S	S	M	L	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

Level of Correlation between CO and PO	L- LOW	M- MEDIU M	S- STRONG
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<b>Tutorial Schedule</b>	
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Discussions</li> <li>3. Interactive sessions</li> <li>4. Presentation</li> <li>5. Mind mapping</li> <li>6. Field visit</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>1. Unit test</li> <li>2. Assignment</li> <li>3. Internal exam evaluation</li> </ol>

<b>Designed By</b>	<b>Verified By</b>	<b>Approved By</b>
Dr.D.AMARESAN	Dr.D.SUGANYA	
		





**List of Allied Courses Offered to Chemistry Department  
B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2022-2023 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UZOAP1	PRACTICAL : ALLIED ZOOLOGY PRACTICALS	GEC PRACTICAL -I	II	3	0	0	3	3
<b>Objective</b>	To understand the model animals as specimen / slides, provide the skill of drawing and labeling and economically importance animals.							
<b>S.No.</b>	<b>List of Experiments / Programmes</b>						<b>Knowledge Levels</b>	<b>Sessions</b>
1	Cockroach - Digestive System						K1-K3	
2	Fish - Digestive System						K1-K3	
3	Prawn- Appendages						K1 -K2	
4	Earthworm - setae						K2	
5	Honey bee - Mouth parts						K2	
6	Mosquito-Mouth parts						K2	
7	Amoeba, Paramecium, Aurelia, <i>Fasciola hepatica</i> , Taenia Scolex, Fasciola-C.S, Ascaris - Male and Female, Star fish , Nauplius and Mysis larva, Amphioxus, Shark, Cobra, Pigeon, Hens egg, Teloest fish, Lac insect, Honey bee - Different castes, Silkworm - Adult, Caterpillar, Pupa and Cocoon, Pisciculture - Edible fishes						K1-K2	
8	Economic importance: Honey, Bee's Wax, Silk, Pearl						K1-K3	
9	Economic importance : Dairy products - Butter, Ghee, Cheese.						K1-K3	
<b>Course Outcome</b>	After completion of the course, students should be able to							
	CO1: Understand the basic concepts of zoology and its importance						K1-K3	
	CO2: Observe the different anatomy of specimens						K1-K3	
	CO3: Apply the practical knowledge in the real life						K1 -K2	
	CO4: Analyze the economic importance of various animal products						K2	
	CO5: Enhance the knowledge about economically important animals to involve in farming of animals						K2	
<b>Learning Resources</b>								
<b>Text Books</b>	1.R. L. Kotpal (2013) Modern textbook of Zoology: Invertebrates , Sixth Edition, RASTOGI Publications.							
<b>Reference Books</b>	1. Verma. P.S. & Agarwal V.K (2006) Cell Biology, Genetics, Molecular Biology, Evolution and Ecology-S. Chand & Company LTD. 2. Ekambaranatha Ayyar, M & Ananthakrishnan, T. N. (1964) Manual of Zoology, Vol I & II							
<b>Website Link</b>	1. <a href="https://bit.ly/3ASuTOK">https://bit.ly/3ASuTOK</a> 2. <a href="https://bit.ly/3wWFiaF">https://bit.ly/3wWFiaF</a> 3. <a href="https://bit.ly/3qcLyHq">https://bit.ly/3qcLyHq</a>							
L-Lecture T-Tutorial P-Practical C-Credit								

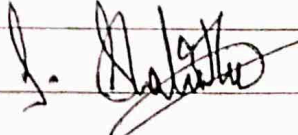
B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UZOA P1	PRACTICAL : ALLIED ZOOLOGY PRACTICALS	GEC PRACTICAL -I	II	3			3	3

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	L	S	S	S	S	S	S
CO2	S	M	S	S	S	S	S	S	M	S
CO3	S	L	L	M	S	S	M	M	S	S
CO4	S	L	M	L	M	S	S	S	M	S
CO5	S	M	M	M	S	S	S	S	S	S

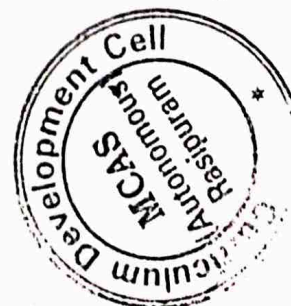
Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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Teaching and Learning Methods	<ol style="list-style-type: none"> <li>1. Practical demonstration</li> <li>2. Virtual Dissections</li> <li>3. Chart explanation</li> <li>4. Observations of specimens</li> </ol>
Assessment Methods	<ol style="list-style-type: none"> <li>1. Model practicals</li> <li>2. Observation</li> <li>3. Record</li> </ol>

Designed By	Verified By	Approved By
Dr.D. AMARESAN	Dr. M. SURESHKUMAR	







List of Skill Based Elective Course (SEC) for B.Sc., Zoology  
SYLLABUS - LOCF-CBCS Pattern  
EFFECTIVE FROM THE ACADEMIC YEAR 2021-2022 Onwards

S.No.	SEM	COURSE_CODE	TITLE OF THE COURSE
1	III	21M3UZOS01	SERICULTURE
2	IV	21M4UZOS02	DAIRY SCIENCE
3	V	21M5UZOS03	POULTRY SCIENCE -I
4	VI	21M6UZOS04	POULTRY SCIENCE -II
5	VI	21M6UZOS05	MUSHROOM TECHNOLOGY
6	VI	21M6UZOS06	APICULTURE

**B.Sc.,-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Se m	Hour s	L	T	P	C
21M3UZOS01	SERICULTURE	SEC - I	III	3	3	0	0	2

**Objective** To learn the classification, rearing, maintenance and economic importance of sericulture

Unit	Course Content	Knowledg e Levels	Session s
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I	Introduction – Importance of sericulture– Mulberry plant - Classification of commercial varieties of mulberry. Mulberry plant cultivation practices.	K1	4
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II	Classification and Biology of silk moth – familiar and economically import types of silkworms – life cycle study of Bombyx mori. Diseases of silk worms - fungal, bacterial, viral and nematode diseases, deficiency diseases and their remedial measures.	K2	5
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III	Tools of sericulture– cultural methods and management of mulberry silk worms - Silkworm rearing operations – Chawki rearing and late age rearing techniques.	K2	6
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IV	Harvesting methods- Physical and commercial characters of cocoons. Reeling operations, importance of by – products of Sericulture.	K2-K3	7
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V	Economics of Sericulture – Future and progress of sericulture in India. Role of State and central silk board – employment opportunities - Prospects of sericulture as self Employment as cottage industry.	K2-K3	8
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<b>Course Outcome</b>	After completion of the course, students should be able to		
	CO1: Understand the classification and importance of sericulture	K1	
	CO2: Illustrate the types and management of silk worms	K2	
	CO3: Know the cultural methods and rearing techniques	K2	
	CO4: Analyze the harvesting and by-products of sericulture	K3	
	CO5: Develop the self-employability skills	K3	

**Learning Resources**

<b>Text Books</b>	1. Ganga, G. (2003) comprehensive sericulture Vol-1, Morigulture – Oxford –IBH Puubl. Co. India
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<b>Reference Books</b>	1. Ganga, G. and Sculochana Chetty, J. (1997) An Introduction to sericulture Oxford – IBHPubl. Co. India 2. Ganga, G. (2003) comprehensive sericulture Vol –II Silkworm rearing – Oxford – IBH Publ. Co. India
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<b>Website Link</b>	1. <a href="https://bit.ly/3ReaWZg">https://bit.ly/3ReaWZg</a> 2. <a href="https://bit.ly/3TLsXQa">https://bit.ly/3TLsXQa</a> 3. <a href="https://bit.ly/3ASDgtc">https://bit.ly/3ASDgtc</a>
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L-Lecture			T-Tutorial	P-Practical	C-Credit		
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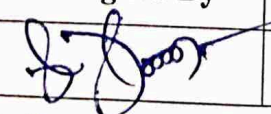
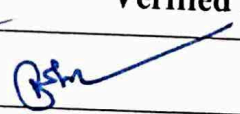
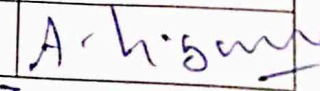
**B.Sc.,-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UZOS01	SERICULTURE	SEC - I	III	3	3	0	0	2

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	M	L	L	S	S	S	S	S	S
CO2	S	L	S	M	S	S	S	S	S	S
CO3	S	S	S	L	S	S	S	M	S	S
CO4	S	L	M	L	M	S	S	S	S	S
CO5	S	M	L	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW	M-MEDIUM		S-STRONG						

<b>Tutorial Schedule</b>	--
<b>Teaching and Learning Methods</b>	1. Lectures 2. Discussions 3. Interactive sessions 4. Presentation 5. Mind mapping 6. Field visit
<b>Assessment Methods</b>	1. Unit test 2. Assignment 3. Internal exam evaluation

<b>Designed By</b>	<b>Verified By</b>	<b>Approved By</b>
		
[Dr. D. AMARESAN]	[Dr. M. SURESH KUMAR]	



**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Se m	Hours	L	T	P	C
21M4UZOS02	DAIRY SCIENCE	SEC - II	IV	3	3	0	0	2
<b>Objective</b>	To know about dairy breeds, products, nutritional value and marketing of dairy products							
Unit	Course Content						Knowledge Levels	Sessions
I	Dairy farming - Definition - Scope - Role of Co-operative societies in milk production and marketing.						K1	5
II	Dairy breeds of India and its classification - Exotic cow breeds - Jersey and Red sindhi. Indian breeds - Kangayam, Buffalo - Murrah.						K2	6
III	Common cattle feed and their nutritive value - Balanced ration for cattle.						K2	6
IV	Milk - Composition - Nutritive value and Pasteurization of milk. Milk products - Butter, Ghee, Cheese.						K3	6
V	Diseases prevention and control measures : Bacterial diseases - Anthrax, Mastitis, Viral diseases - Foot and mouth disease, Non-contagious disease, Milk fever, Fungal diseases - ringworm infections.						K3	7
<b>Course Outcome</b>	After completion of the course, students should be able to							
	<b>CO1:</b> Understand the importance of the dairy farming and milk production						K1	
	<b>CO2:</b> Know the dairy breeds and its products						K2	
	<b>CO3:</b> Interpret the nutritive value of cattle feed						K3	
	<b>CO4:</b> Categorize the milk products and its nutritive values						K3	
<b>CO5:</b> Develop the self employability skills						K3		
<b>Learning Resources</b>								
<b>Text Books</b>	1. Y. H. Hui 1996, Dairy Science and Technology Handbook: Volume I, II, & III, Wiley publisher							
<b>Reference Books</b>	1. Banerjee G.C. A text book of Animal Husbandry Oxford & IBH publishing Co Pvt. Ltd., New Delhi. 8th Edition 2. Ibraheem Kutty C. and Sheeba Khamer, Milk Production and processing. Daya publishing House, Delhi, 2014							
<b>Website Link</b>	1. <a href="https://bit.ly/3KMUDA9">https://bit.ly/3KMUDA9</a> 2. <a href="https://bit.ly/3KKpoWB">https://bit.ly/3KKpoWB</a> 3. <a href="https://bit.ly/3BfyDuQ">https://bit.ly/3BfyDuQ</a>							

L-Lecture

T-Tutorial

P-Practical

C-Credit

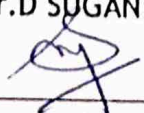

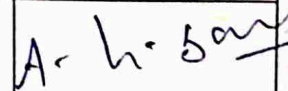
**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

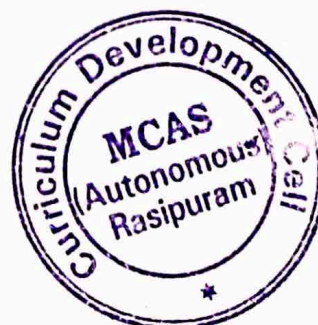
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UZOS02	DAIRY SCIENCE	SEC - II	IV	3	3	0	0	2

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	L	S	S	M	M	S	M
CO2	S	L	S	L	M	S	S	S	M	S
CO3	S	L	S	L	S	S	S	S	M	S
CO4	S	S	M	M	S	L	M	M	S	S
CO5	S	M	S	S	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW	M-MEDIUM		S-STRONG						

<b>Tutorial Schedule</b>	<ol style="list-style-type: none"> <li>Interactive sessions</li> <li>Quiz</li> </ol>
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>Lectures</li> <li>Discussions</li> <li>4. Presentation</li> <li>Mind mapping</li> <li>Field visit</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>Unit test</li> <li>Assignment</li> <li>Internal exam evaluation</li> </ol>

Designed By	Verified By	Approved By
Dr.D SUGANYA 	Dr. M. SURESHKUMAR 	



**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOS03	POULTRY SCIENCE-I	SEC - III	V	2	2	0	0	2

**Objective** To instill the knowledge about poultry rearing techniques

Unit	Course Content	Knowl edge Levels	Sessions
I	Introduction to poultry science -Poultry industry in India - Poultry breeds and classes of fowls -Poultry housing and its maintenance - Integration of poultry frming	K1	10
II	Rearing of Chicks - Growers and Layers - Breeder broiler and hatchery-equipments -Automation in poultry houses- Management of layers and Broilers.	K2- K3	8
III	Poultry nutrition -Composition of poultry feed- Nutrient requirements for fowl, Vitamins and Minerals. Systems of feeding - restricted, forced, controlled and phase feeding - nutritional deficiency symptoms.	K3	8
IV	Use of Additives and Non additives- enzymes, probiotics, prebiotics antibiotics, herbs, performance enhancers - Utilization of non-conventional feedstuff.	K2	9
V	Poultry diseases: Ranikhet disease or New castle disease, Mycoplasma-CRD. Vaccination schedules.	K2- K3	10
<b>Course Outcome</b>	After the completion of course, students should be able to		
	CO1: Gain knowledge of basic concept of poultry management	K1	
	CO2: Gain knowledge about nutrition and its deficiency	K2- K3	
	CO3: Learn about food additives and poultry food stuffs	K3	
	CO4: Gain the knowledge about on rearing techniques	K3	
	CO5: Know about poultry management	K3	

**Learning Resources**

<b>Text Books</b>	1. Hofstad, M.S., Jhon Barnes, H., Calnek, B.W., Reid, W.M and Yoder, H.W (1984) Disease of poultry , Iowa State University Press.
<b>Reference Books</b>	2. Mack O. North , Donald D. Bell (1990)Commercial Chicken Production Manual, 4th edition, Chapman & Hall, New York 3. Leeson, S. and summers, J.D. (2005) Commercial Poultry Nutrition. Third Edition, Nottingham University Press, Nottingham.
<b>Website Link</b>	1. <a href="https://bit.ly/3UnLCm2">https://bit.ly/3UnLCm2</a> 2. <a href="https://bit.ly/2Ha0Jbr">https://bit.ly/2Ha0Jbr</a>

L-Lecture    T-Tutorial    P-Practical    C-Credit



**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOS03	POULTRY SCIENCE-I	SEC - III	V	2	2	0	0	2

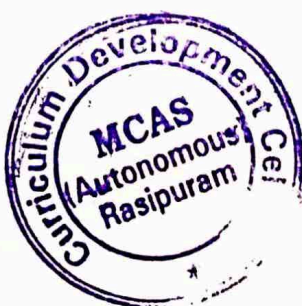
**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	L	M	S	S	M	M	M
CO2	S	M	S	L	S	S	S	S	M	S
CO3	S	M	M	M	M	S	S	S	S	S
CO4	S	L	M	M	L	S	S	M	M	M
CO5	S	L	M	M	M	S	M	S	L	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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<b>Tutorial Schedule</b>	<ol style="list-style-type: none"> <li>Interactive sessions</li> <li>Quiz</li> </ol>
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>Lectures</li> <li>Discussions</li> <li>Presentation</li> <li>Mind mapping</li> <li>Field visit</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>Unit test</li> <li>Assignment</li> <li>Internal exam evaluation</li> </ol>

<b>Designed By</b>	<b>Verified By</b>	<b>Approved By</b>
Dr. D. AMERASAN	Dr. D. SUGANYA	<i>[Signature]</i>



**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOS04	POULTRY SCIENCE-II	SEC - IV	VI	2	2	0	0	2
Objective	To instill the knowledge about poultry rearing techniques							
Unit	Course Content	Knowl edge Levels	Session s					
I	Biosecurity & health management - summer and winter management. HACCP application for safe egg - Prevention of eggs contamination.	K1- K3	10					
II	Poultry processing techniques. Grading of eggs & meat. Chemical composition and nutritive value of eggs and meat - Poultry byproduct and its uses.	K2- K3	8					
III	Concepts in meat and egg preservation - Newer concepts in meat tenderization, canning, dehydration, curing, irradiation, etc.	K3	8					
IV	Egg desugarization - pasteurization - Functional properties of eggs - Industrial uses of eggs - Marketing trends in poultry meat and eggs	K2	9					
V	Future trends in broiler and egg production -factors influencing the profit margin in poultry enterprises.	K2- K3	10					
Course Outcome	After the completion of course, students should be able to							
	CO1: Understand the concept of quality control and economic values of poultry product	K1- K3						
	CO2: Gain knowledge about preservation techniques of meat and eggs	K2- K3						
	CO3: Learn about industrial uses of eggs	K3						
	CO4: Gain the knowledge about on disease management	K3						
	CO5: Know about scope of poultry industries	K3						
Learning Resources								
Text Books	1. Hofstad, M.S., Jhon Barnes, H., Calnek, B.W., Reid, W.M and Yoder, H.W (1984) Disease of poultry , Iowa State University Press.							
Reference Books	2. Mack O. North , Donald D. Bell (1990)Commercial Chicken Production Manual, 4th edition, Chapman & Hall, New York 3. Leeson, S. and summers, J.D. (2005) Commercial Poultry Nutrition. Third Edition, Nottingham University Press, Nottingham.							
Website Link	1. <a href="https://bit.ly/3UnLCm2">https://bit.ly/3UnLCm2</a> 2. <a href="https://bit.ly/2Ha0Jbr">https://bit.ly/2Ha0Jbr</a>							

**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOS04	POULTRY SCIENCE-II	SEC - IV	V	2	2	0	0	2

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	L	M	S	S	M	M	M
CO2	S	M	S	L	S	S	S	S	M	S
CO3	S	M	M	M	M	S	S	S	S	S
CO4	S	L	M	M	L	S	S	M	M	M
CO5	S	L	M	M	M	S	M	S	L	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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<b>Tutorial Schedule</b>	3. Interactive sessions 4. Quiz
<b>Teaching and Learning Methods</b>	6. Lectures 7. Discussions 8. Presentation 9. Mind mapping 10. Field visit
<b>Assessment Methods</b>	1. Unit test 2. Assignment 3. Internal exam evaluation

Designed By	Verified By	Approved By
Dr. D. AMERASAN <i>[Signature]</i>	Dr. D. SUGANYA <i>[Signature]</i>	<i>[Signature]</i> Dr. S. Srinivasan



**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOS05	MUSHROOM TECHNOLOGY	SEC - IV	VI	2	2	0	0	2
Objective	To gain knowledge about the rearing of edible mushroom and its economic importance							
Unit	Course Content						Knowl edge Levels	Sessio ns
I	Introduction, History, Scope and Importance of Mushroom cultivation - Mushroom research and development						K1	9
II	Media Preparation for Pure Culture - Maintenance of mother culture in test tube slants, Petri plates, saline bottle, Poly propylene bags - Spawn production, Storage methods and						K1-K3	8
III	Cultivation Technology Infrastructure - Culture rack, thatched house, Substrate, vessels, inoculation methods - Mushroom bed preparation, preservation Technology - Long term and short-						K2	12
IV	Post-harvest handling short and Long-term storage - Mushroom Types and importance of edible mushroom in India <i>Agaricus bisporus</i> , <i>Pleurotus sp.</i> , <i>Volvariella volvacea</i> , <i>Calocybe indica</i> - Poisonous Mushrooms						K1-K3	8
V	Nutritional and medicinal value of Mushrooms - Economic importance of mushroom cultivation						K1-K3	8
Course Outcome	After the completion of course, students will be able to							
	CO1: Gain fundamental knowledge about the importance of mushroom cultivation						K1	
	CO2: Acquire knowledge about the Rearing process						K1-K3	
	CO3: Gain knowledge about the cultivation technology						K2	
	CO4: Get a good knowledge about the harvest methods and handling techniques						K1-K3	
	CO5: Acquire knowledge about the nutritional, medicinal values and economic importance of mushrooms						K1-K3	

**Learning Resources**

Text Books	1. Chang, S. T. and W. A. Hayes. 1978. The Biology and Cultivation of Edible Mushrooms. Academic Press. New York. 230 P
Reference Books	1. Chang, Shu-Ting and Philip G. Miles. 2004. Mushrooms: Cultivation, Nutritional Value, Medicinal Effect, and Environmental Impact. CRC Press. 2. Flegg; R. 1985. Biology and Technology of the Cultivated Mushroom. UMI Books on Demand. Ann Arbor, Michigan (1-800-521-0600).
Website Links	1. <a href="https://bit.ly/3Ap2fod">https://bit.ly/3Ap2fod</a> 2. <a href="https://bit.ly/3n5dVt5">https://bit.ly/3n5dVt5</a>

L-Lecture      T-Tutorial      P-Practical      C-Credit

B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOS05	MUSHROOM TECHNOLOGY	SEC - IV	VI	2	2	0	0	2

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	M	L	S	M	S	L	S
CO2	S	M	M	S	M	S	S	M	M	M
CO3	S	L	M	M	M	S	S	S	S	L
CO4	S	M	S	M	M	S	S	S	M	S
CO5	M	L	M	M	M	M	S	M	M	S

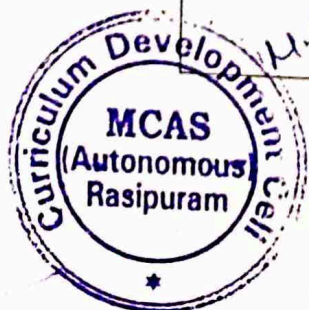
  

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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Tutorial Schedule

Teaching and Learning Methods	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Discussions</li> <li>3. Interactive sessions</li> <li>4. Presentation</li> <li>5. Mind mapping</li> <li>6. Field visit</li> </ol>
Assessment Methods	<ol style="list-style-type: none"> <li>1. Unit test</li> <li>2. Assignment</li> <li>3. Internal exam evaluation</li> </ol>

Designed By	Verified By	Approved By
Dr. M. PRABU	Dr. D. SUGANYA	



**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOS06	APICULTURE	SBEC-VI	VI	2	2	0	0	2

**Objective** To gain knowledge about the fundamentals of microorganism, immunology and their related diseases

Unit	Course Content	Knowledge Levels	Sessions
I	<b>Honey bee species and identification:</b> Introduction to honey bee; Origin, systematics and distribution; Types of honey bees, Species of honey bees. Bees' identification.	K1	5
II	<b>Rearing of Bees</b> Artificial Bee rearing (Apiary), Beehives - Newton and Langstroth, Bee Pasturage, Selection of Bee Species for Apiculture, Bee Keeping Equipment, Methods of Extraction of Honey (Indigenous and Modern)	K1-K3	10
III	<b>Diseases and Enemies - Bee Diseases and Enemies Control and Preventive measures</b>	K2	5
IV	<b>Social organization in honey bees:</b> Colony life and social organization - Queen, drone, worker. Annual biological cycle of the bee colony.	K1-K3	10
V	<b>Economic importance of apiculture:</b> Role of State and central Government for promoting Apiculture in India.	K1-K3	10
<b>Course Outcome</b>	After the completion of course, students will be able to		
	CO1: Acquire fundamental knowledge about the species honey bee	K1	
	CO2: Acquire knowledge about the Rearing process	K1-K3	
	CO3: Gain knowledge about the Diseases and the Enemies	K2	
	CO4: Get an idea of the social organization in honey bees	K1-K3	
	CO5: List out the economic importance of honey bee	K1-K3	

**Learning Resources**

<b>Text Books</b>	1. Cherian R, & K.R. Ramanathan, 1992 - Bee keeping in India 1. Mishra, R.C., 1985 - Honey bees and their Management in India. ICAR.
<b>Reference Books</b>	1. Singh, S. 1982 - Beekeeping ICAR 2. Sharma, P and Singh L. 1987 - Hand book of bee keeping. Chandigarh. 3. Rare, S. 1998 - Introduction to keeping, Vikas publishing house.
<b>Website Links</b>	1. <a href="https://bit.ly/3L6efji">https://bit.ly/3L6efji</a> 2. <a href="https://bit.ly/3H6qhbi">https://bit.ly/3H6qhbi</a>

**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOS06	APICULTURE	SBEC-VI	VI	2	2	0	0	2

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	M	M	M	S	M	M	M	S
CO2	S	S	M	S	S	M	M	S	M	L
CO3	M	L	M	M	S	M	M	M	L	S
CO4	M	M	S	M	M	L	S	M	M	M
CO5	M	M	M	L	M	M	S	M	M	S
Level of Correlation between CO and PO		L-LOW			M-MEDIUM			S-STRONG		

**Tutorial Schedule**

<b>Teaching and Learning Methods</b>	1. Lectures 2. Discussions 2. Interactive sessions 3. Presentation 4. Mind mapping 5. Field visit
<b>Assessment Methods</b>	1. Unit test 2. Assignment 3. Internal exam 4. Evaluation

Designed By	Verified By	Approved By
Dr. V. VINITA VINJOY JERUSHA <i>Vinita Vinjoy LV</i>	Dr. D. SUGANYA <i>[Signature]</i>	<i>[Signature]</i> Dr. S. Suresh



**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M5UZOIS1	INTERNSHIP TRAINING	INTERNSHIP	V	-	-	-	-	-
<b>Objective</b>	The main purpose of this internship program is to particularly provide exposure to the working environment of various industries and research institutions/Company. During this period, the Students will get hands on training in the diverse areas of zoology.							
GUIDELINES FOR INTERNSHIP TRAINING PROGRAMME							Knowledge Levels	Sessions
1	Duration of the Internship Programme is 15 Days During the Vacation which falls at the end of the 4 <sup>th</sup> Semester						K4	
2	Students may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/ Government organizations/ Micro/ Small/ Medium enterprises to make them ready for the industry. The students will select the institutions, industries and trainer like Clinical Lab/ Sugarcane Industry/ Aquaculture Industries/ Dairy/ Marine Research Station/ Poultry Farm / Soil Testing Organic Farming/ Medical Coding/ TNAU/ Veterinary University/ Molecular Biology Lab/Hospitals/ Vermitechnology Unit / Mushroom Production Unit and zoology relevant companies/Industries/research institutes.							
3	A staff member of a department (Advisor) will be monitoring the performance of the candidate							
4	Students submit their request letter/profile/ interest areas may be submitted to the particular industry/Company for their willingness for providing the internship program.							
5	After Getting the acceptance/permission from the internship provider, the student must submit the Joining Report/ Letters / Email to the department by in person.							
6	Student will maintain the work diary and attending internship properly in the selected Institute/company/Lab.							
7	Every student is required to prepare a file containing documentary proofs of the activities done by them							



	like Student's Diary and Internship Report. After the successful completion of their training, Students should collect the Internship training certificate, Attendance and work diary duly signed by the internship programme in-charge of the institute.				
8	Student should prepare a comprehensive report to indicate what he has observed and learnt in the training period.				
9	Internship report should be soft cover book bound, the cover of the report should be of white color printed with black ink and the text for printing should be identical as prescribed for the title page. The Internship Training Certificate also included in the report.				
10	The evaluation of these activities will be done by Internship advisor of the department/ Head of the Department/Industrial experts/Subject experts				
<b>Course outcome</b>	Internships are educational and career development opportunities, providing practical experience in a field or discipline. Students will get hands on training in the diverse areas of Zoology.			K4	
	L-Lecture		T- Tutorial	P- Practical	C- Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M5UZ0IS1	INTERNSHIP TRAINING	INTERNSHIP	V	-	-	-	-	-

### CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	L	S	S	S	M	M
CO2	S	S	M	S	L	S	M	S	M	M
CO3	S	M	S	S	S	S	S	S	S	M
CO4	S	M	S	S	S	S	S	S	S	M
CO5	S	L	S	S	L	S	S	S	S	S

Level of Correlation  
between CO and PO

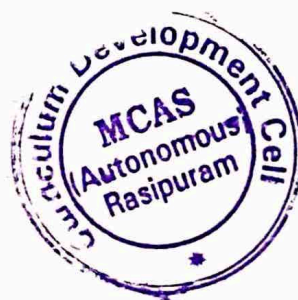
L-LOW

M-MEDIUM

S-STRONG

<b>Tutorial Schedule</b>	
<b>Teaching and Learning Methods</b>	1. Interactive Session 2. PPT Presentation
<b>Assessment Methods</b>	1. Work Diary- 25% 2. Internship Training report preparation: 50% 3. Viva Voce: 25%

Designed By	Verified By	Approved By
Dr. V.VINITA VINJOY JERUSHA <i>Vinita Vinjoy CV</i>	Dr. D. SUGANYA <i>[Signature]</i>	<i>[Signature]</i>



List of Non Major Elective Course (NMEC) offered by the B.Sc., Zoology  
SYLLABUS - LOCF-CBCS Pattern  
EFFECTIVE FROM THE ACADEMIC YEAR 2021-2022 Onwards

S.No.	SEM	COURSE_CODE	TITLE OF THE COURSE
1	III	21M3UZON01	HUMAN ANATOMY & PHYSIOLOGY
2	IV	21M3UZON02	ANIMAL BEHAVIOUR
3	III	21M4UZON03	ANIMAL HUSBANDARY
4	IV	21M4UZON04	WILDLIFE CONSERVATION

**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UZON01	HUMAN ANATOMY AND PHYSIOLOGY	NMEC - I	III	2	20			2

**Objective** To analyze the knowledge about on human anatomical, physiological functions and their mechanisms.

Unit	Course Content	Knowl edge Levels	Sessions
I	Structure of Alimentary tract and accessory organs of digestion	K1	4
II	Structure of organs of urinary system : Kidney, Ureters, Urinary bladder, Urethra.	K1	4
III	Structure of respiratory system and mechanism of respiration	K2	4
IV	Circulatory System- Blood-microscopic structure-Structure of the heart. Structure of the blood vessels - Arterial and venous system - Circulation: Systemic, pulmonary, coronary.	K1	4
V	Structure and functions of male and female reproductive organs.	K1-K2	4
<b>Course Outcome</b>	After completion of the course, students should be able to		
	CO1: Understand the digestion and their mechanisms.	K1	
	CO2: Acquire the knowledge of urino - genital system and its functions	K1	
	CO3: Discuss the basic structure and functions of respiratory and circulatory system.	K2	
	CO4: Explain the endocrinological functions of human reproductive and excretory organs	K1	
	CO5: Apply the human physiological and anatomical functions to our real life	K1-K2	

**Learning Resources**

<b>Text Books</b>	1. Elaine N Marieb( 2012) Human Anatomy, Seventh Edition, PEARSON Publication.
<b>Reference Books</b>	1.Verma P.S. & Tyagi B.S. Animal Physiology, 6 edition. S.Chand Publication 2. Hoar, W.S (1987) General and Comparative physiology, prentice - Hall. M.K.Chanddrashekar - Circadian Rhythms - Madras science foundation, Chennai.
<b>Website Link</b>	1. <a href="https://bit.ly/3KPTt7i">https://bit.ly/3KPTt7i</a> . 2. <a href="https://bit.ly/3wWoUah">https://bit.ly/3wWoUah</a>

L-Lecture

T-  
Tutorial

P-  
Practical

C-  
Credit



**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UZON01	HUMAN ANATOMY AND PHYSIOLOGY	NMEC - I	III	2	2			2

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	L	L	S	S	S	S	M	M
CO2	S	M	L	M	S	S	S	S	S	M
CO3	S	S	M	L	M	S	S	S	M	M
CO4	S	M	L	M	S	S	S	S	M	S
CO5	S	M	M	L	S	S	S	S	S	M

Level of Correlation between CO and PO	L- LOW	M- MEDIUM	S- STRONG
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<b>Tutorial Schedule</b>	
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Discussions</li> <li>3. Intractive sessions</li> <li>4. Presentation</li> <li>5. Mind mapping</li> <li>6. Field visit</li> </ol>
<b>Assesment Methods</b>	<ol style="list-style-type: none"> <li>1. Unit test</li> <li>2. Assignment</li> <li>3. Internal exam evaluation</li> </ol>

<b>Designed By</b> <i>M. Prabu</i> Dr. M. PRABU	<b>Verified By</b> <i>[Signature]</i> Dr. D. SUGANYA	<b>Approved By</b> <i>[Signature]</i> Dr. S. SURESH
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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UZON02	ANIMAL HUSBANDARY	NMEC -III	III	2	2			2

Objective To know about the rearing of domestic animals, develop the entrepreneurship skills and its economic importance

Unit	Course Content	Knowledge Levels	Sessions
I	Livestock animals - Classification of Farm Animals - Ruminants, Non-ruminants and Herbivores.	K1-K2	4
II	Types and Classes of Domesticated cattle - Beef Cattle, Dairy Cattle, Dual purpose cattle and Draught Cattle.	K1-K2	4
III	Animal Feeding/Nutrition - Roughage - Forage Conservation.	K3	4
IV	Animal Health - Signs of Good Health - Causes Diseases and Disorders - Diagnosis of Disease.	K2	4
V	Economic importance of dairy products.	K3	4

Course Outcome	Course Content	Knowledge Levels
	After completion of the course, students should be able to	
	CO1: Understand about animal husbandry, behavior and handling techniques	K1-K2
	CO2: Discuss the Basic characteristics of common breeds of livestock species	K1-K2
	CO3: Demonstrate confidence in attaining transferable job skills	K3
	CO4: Build and sustain productive relationships to create a positive change in response to challenging issues	K2
	CO5: Develop the entrepreneurship skills to enhance the self employability	K3

#### Learning Resources

Text Books	1.G. C. Banerjee (2019) Text Book of Animal Husbandry, Eighth edition, CBS Publication.
Reference Books	1. DeHaan, Cees; Steinfeld, Henning; Blackburn, Harvey (1997). Livestock & the environment: finding a balance. European Commission Directorate-General for Development
Website Link	1. <a href="https://bit.ly/3BjArD7">https://bit.ly/3BjArD7</a> 2. <a href="https://bit.ly/3KMSON3">https://bit.ly/3KMSON3</a>

L-Lecture

T-  
Tutorial

P-  
Practical

C-  
Credit



**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UZON02	ANIMAL HUSBANDARY	NMEC -III	III	2	2			2

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	S	S
CO2	S	M	M	M	M	S	S	S	M	S
CO3	S	M	M	L	M	S	S	S	S	M
CO4	S	M	M	M	L	S	S	S	S	S
CO5	S	S	S	M	S	S	S	S	S	M
Level of Correlation between CO and PO	L- LOW	M- MEDIUM	S- STRONG							

Tutorial Schedule	
Teaching and Learning Methods	1. Lectures 2. Discussions 3. Intractive sessions 4. Presentation 5. Mind mapping 6. Field visit
Assesment Methods	1. Unit test 2. Assignment 3. Internal exam evaluation

Designed By	Verified By	Approved By
DR.D.AMARESAN <i>[Signature]</i>	Dr.D. SOGANYA <i>[Signature]</i>	<i>[Signature]</i>

*[Signature]*  
 (Dr. S. Srinivasan)







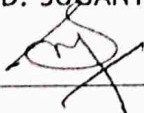
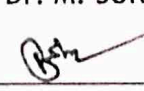
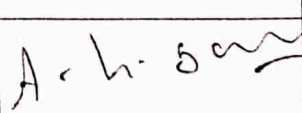
**B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UZON02	ANIMAL BEHAVIOR	NMEC - II	IV	2	2	0	0	2

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	L	M	M	M	M	M	M	S
CO2	S	L	M	S	S	S	S	S	M	S
CO3	S	M	L	S	M	S	S	S	M	S
CO4	S	M	M	M	S	S	S	S	S	M
CO5	S	S	M	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG							

<b>Tutorial Schedule</b>	<ol style="list-style-type: none"> <li>Interactive sessions</li> <li>Quiz</li> </ol>
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>Lectures</li> <li>Discussions</li> <li>Presentation</li> <li>Mind mapping</li> <li>Field visit</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>Unit test</li> <li>Assignment</li> <li>Internal exam evaluation</li> </ol>

Designed By	Verified By	Approved By
Dr.D. SUGANYA 	Dr. M. SURESHKUMAR 	



**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M4UZON04	WILDLIFE CONSERVATION	NMEC-IV	VI	2	2	0	0	2
<b>Objective</b>	To understand the concept of wildlife conservation							
Unit	Course Content	Knowledge Levels	Sessions					
I	Wildlife parks, Wildlife Reserves, Biosphere Reserves - Project Tiger, Project Elephant, Valley of Flowers- Wildlife Management	K1-K3	8					
II	Important International conventions and treaties on nature and conservation - India's role and contribution, Ex-situ and In-situ conservation, Wildlife and Human Welfare.	K1-K2	8					
III	Strategies to reduce human-wildlife interactions, Zoos, Natural history museums - ZSI, BSI, FRI, CMFRI.	K1-K2	8					
IV	Wildlife Protection act of India - CITES - TRAFFIC - RED Data Book - Measures to control poaching and Wild life trade - Protected Areas Network.	K1-K2	8					
V	International Role of NGOs in conservation - Chipko movement, Seed movement- Agroforestry - Principles of Remote Sensing and GIS.	K1-K3	8					
<b>Course Outcome</b>	After the completion of course, students shall be able to							
	CO1: Understand the wildlife conservation methods and management of wildlife conservation	K1-K3						
	CO2: Acquire knowledge about the role of National and International bodies in wildlife conservation	K1-K2						
	CO3: Understand the role of different organizations involved in wildlife conservation	K1-K2						
	CO4: Acquire knowledge about Wildlife Protection acts	K1-K2						
	CO5: Understand the role of NGOs and GIS in wildlife conservation	K1-K2						
<b>Learning Resources</b>								
<b>Text Books</b>	1. Singh, S.K. 2020. Textbook of Wildlife Management. 3 <sup>rd</sup> edition. CBS Publisher, U.S.A, 2. Leopold, A. 1993. Textbook of Wildlife Conservation and Management. Leopold Aldo Publisher.							
<b>Reference Books</b>	1. Reena, M. 2018. Wildlife Conservation and Management. Rastogi Publications, India. 2. Tapashi, G. 2017. Ecology, Wildlife Conservation & Management. EBH Publisher, India.							
<b>Website Links</b>	1. <a href="https://wildnet.org/">https://wildnet.org/</a> 2. <a href="https://bit.ly/2XKw9hs">https://bit.ly/2XKw9hs</a>							

**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
	WILDLIFE CONSERVATION	NMEC-IV	VI	2	2	0	0	2

L-Lecture T-Tutorial P-Practical C-Credit

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	M	S	M	S	S	M
CO2	S	L	M	S	M	S	S	S	M	L
CO3	S	M	S	L	M	M	M	S	S	M
CO4	M	S	M	S	S	S	S	S	S	S
CO5	S	M	S	M	S	S	S	S	S	M
Level of Correlation between CO and PO			L-LOW		M-MEDIUM			S-STRONG		

Tutorial Schedule	
Teaching and Learning Methods	<ol style="list-style-type: none"> <li>Lectures</li> <li>Discussions</li> <li>Interactive sessions</li> <li>Presentation</li> <li>Mind mapping</li> <li>Field visit</li> </ol>
Assessment Methods	<ol style="list-style-type: none"> <li>Unit test</li> <li>Assignment</li> <li>Internal exam evaluation</li> </ol>

Designed By	Verified By	Approved By
Dr.M.PRABU <i>M. Prabu</i>	Dr.D.SUGANYA <i>D. Suganya</i>	<i>[Signature]</i>

*[Dr. S. S. SHARMA]*



List of Elective Course(DSE) Details for B.Sc.,Zoology  
SYLLABUS - LOCF-CBCS Pattern  
EFFECTIVE FROM THE ACADEMIC YEAR 2021-2022 Onwards

S.No.	COURSE_CODE	TITLE OF THE COURSE
1	21M5UZOE01	BIOSTATISTICS
2	21M5UZOE02	BIOTECHNOLOGY
3	21M6UZOE03	MEDICAL LABORATORY TECHNIQUES
4	21M6UZOE04	AQUACULTURE
5	21M6UZOE05	WILD LIFE BIOLOGY
6	21M6UZOE06	PARASITOLOGY

**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M5UZOE01	BIostatISTICS	DSE - I	V	4	4		0	4

Objective	To impart knowledge on laboratorial instrument and its techniques							
Unit	Course Content	Knowledge Levels	Sessions					
I	Collection and Presentation of Statistical Data: Biostatistics - Definition - Types of data - Primary and secondary data - Methods of Collection of data - Sources of data in life science - Limitations and Uses of Statistics - Classification and Tabulation of data - Diagrammatic and Graphical representation of data.	K1	10					
II	Measures of Central Tendency: Definitions - Mean - Median - Mode - Geometric mean - Harmonic mean - Characteristics of a good average - Merits and demerits - Simple Problems.	K2-K3	8					
III	Measures of Dispersion: Range - Quartile deviation - Mean deviation and their coefficients - Standard deviation - Coefficient of variation - Merits and demerits - Simple Problems.	K3	8					
IV	Correlation and Regression: Definitions - Types and Methods of Correlation -Karl Pearson's coefficient of correlation - Spearman's Rank correlation coefficient - Regression: Simple regression equations (two variables) - Simple Problems.	K2	9					
V	Test of Significance: Sampling distribution - Standard error - Test of Hypothesis: Simple hypothesis, Null hypothesis, and Alternative Hypothesis - Test of significance: Large sample tests based on single Mean- Small sample test based on single Mean, Paired 't' test - Chi-square test - Simple Problems.	K2 -K3	10					
Course Outcome	After completion of the course, students will be able to							
	CO1: Understand the scope and necessity of Biostatistics and tabulate and represent the data in diagrams and graphs.	K1						
	CO2: Apply the formula and calculate descriptive measures of central tendency.	K2 -K3						
	CO3: Apply the formula and calculate descriptive measures of dispersion.	K3						
	CO4: Analyze the nature of data and interpret the measures of correlation and regression.	K3						
	CO5: Analyze the nature of data and interpret the for large and small sample tests.	K3						

L-Lecture

T-Tutorial

P-Practical

C-Credit

**Learning Resources**

<b>Text Books</b>	1. Gupta, S.C., and Kappor, V. K. (2020). Fundamentals of Mathematical Statistics, 12 <sup>th</sup> Edition, Sultan Chand & Sons (Publisher), New Delhi, India.
<b>Reference Books</b>	1. Goon, A.M., Gupta, M. K., Dasgupta, B. (2016): Fundamentals of Statistics, Vol. I, World Press, Kolkata, India. 2. Holcomb, Z. C. (2017). Fundamentals of Descriptive Statistics, Routledge, New York, US.
<b>Website Link</b>	1. <a href="https://bit.ly/3no7xgX">https://bit.ly/3no7xgX</a> 2. <a href="https://bit.ly/3NAX10p">https://bit.ly/3NAX10p</a> 3. <a href="https://bit.ly/4164Hea">https://bit.ly/4164Hea</a>

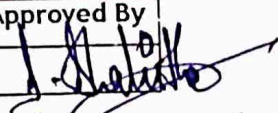
**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

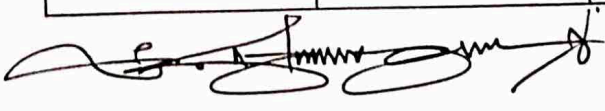
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21MSUZOE01	BIOSTATISTICS	DSE - I	V	4	4		0	4

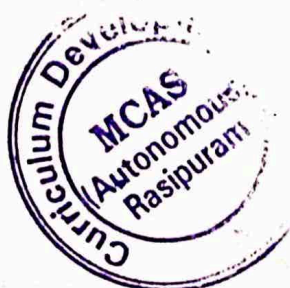
CO-PO Mapping										
CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	S	S	S	M	S	M	S	M	L
CO2	M	M	M	M	S	M	S	S	S	M
CO3	S	M	M	S	S	M	S	M	S	S
CO4	M	M	M	M	M	S	M	M	S	S
CO5	S	M	M	S	S	L	S	M	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

<b>Tutorial Schedule</b>	<ol style="list-style-type: none"> <li>Interactive sessions</li> <li>Quiz</li> </ol>
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>Lectures</li> <li>Discussions</li> <li>Presentation</li> <li>Mind mapping</li> <li>Field visit</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>Unit test</li> <li>Assignment</li> <li>Internal exam evaluation</li> </ol>

<b>Designed By</b>	<b>Verified By</b>	<b>Approved By</b>
Dr. S. MOHANPRABU	Dr. S. MOHANPRABU	

  
**(Dr. S. SHAKTI)**



B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOE02	BIOTECHNOLOGY	ELECTIVE - II	V	4	4	0	0	4
Objective	To imbibe knowledge about biotechnological techniques and their application							
Unit	Course Content					Knowledge Levels	Sessions	
I	Scope of Biotechnology. Biotechnology in India, Methods of Genetic engineering					K1	10	
II	Gene cloning, vectors - plasmid, Cosmids, Phage vectors -Lambda.					K2-K3	8	
III	Enzymes for genetic engineering - Endonucleases, DNA ligases, alkaline phosphates.					K3	8	
IV	Polymerase Chain Reaction (PCR), Blotting techniques (Southern)					K2	9	
V	Application of Biotechnology in Agriculture, Industries, Health.					K2 - K3	10	
Course Outcome	After the completion of course, students will be able to							
	CO1: Gain knowledge of biotechnological methods					K1		
	CO2: Gain knowledge about biotechnological tools used in genetic biotechnology					K2 - K3		
	CO3: Learn about the basics of genetic engineering					K3		
	CO4: Gain knowledge about major techniques of biotechnology					K3		
	CO5: Give an insight to the current applications of biotechnology and advances in the different areas like Agriculture, Industries, Health					K3		

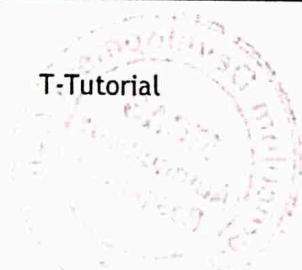
Learning Resources	
Text Books	1. R. C. Dubey (1998). A Text book of Biotechnology, S.Chand & co Ltd New Delhi.
Reference Books	1. Ignachimuthu (1995). Basic Biotechnology. Tata McGraw Hill publishing co Ltd, New Delhi.
Website Link	1. <a href="https://bit.ly/3UnLCm2">https://bit.ly/3UnLCm2</a> 2. <a href="https://bit.ly/2Ha0Jbr">https://bit.ly/2Ha0Jbr</a>

L-Lecture

T-Tutorial

P-Practical

C-Credit



**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOE02	BIOTECHNOLOGY	ELECTIVE - II	V	4	4	0	0	4

**CO-PO Mapping**

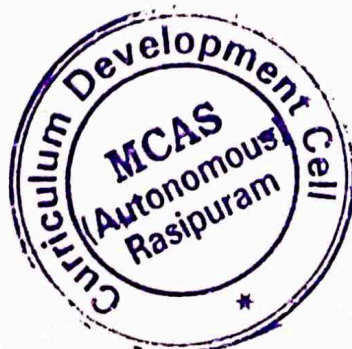
CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	L	M	S	S	M	M	M
CO2	S	M	S	L	S	S	S	S	M	S
CO3	S	M	M	M	M	S	S	S	S	S
CO4	S	L	M	M	L	S	S	M	M	M
CO5	S	L	M	M	M	S	M	S	L	M

Level of Correlation between CO and PO    L-LOW    M-MEDIUM    S-STRONG

<b>Tutorial Schedule</b>	3. Interactive sessions 4. Quiz
<b>Teaching and Learning Methods</b>	6. Lectures 7. Discussions 8. Presentation 9. Mind mapping 10. Field visit
<b>Assessment Methods</b>	4. Unit test 5. Assignment 6. Internal exam evaluation

<b>Designed By</b>	<b>Verified By</b>	<b>Approved By</b>
Dr. D. AMERASAN	Dr. D. SUGANYA	<i>[Signature]</i>

*[Dr. S. SHANTHA]*





**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOE03	MEDICAL LABORATORY TECHNIQUES	ELECTIVE - III	V	4	4	0	0	4
Objective	To instill the knowledge about laboratorial instrument and its techniques							
Unit	Course Content	Knowl edge Levels	Sessions					
I	Urine - Analysis of urine samples - chemical parameters routinely required to be analyzed -Pregnancy tests.	K1	10					
II	Analysis of feces, semen, cerebrospinal fluid for chemical investigation	K2- K3	8					
III	Parasitology and vector biology - Examination of Parasites relevant to human health, Malarial parasite and other protozoans, Helminths and other worms, study of vectors in the transmission of diseases.	K3	8					
IV	Pathology - Organisms causing infectious diseases - Viruses - Measles, poliomyelitis, hepatitis, HIV.	K2	9					
V	Bacteria - Tuberculosis, whooping cough, tetanus, diphtheria, cholera. Protozoans - Amoebic dysentery, malaria, Leishmaniasis. Helminths - Ascariasis, filariasis, Cysticercosis.	K2- K3	10					
Course Outcome	After the completion of course, students should be able to							
	CO1: Gain knowledge of biochemical analysis	K1						
	CO2: Gain knowledge about biochemical investigation	K2- K3						
	CO3: Learn about parasitology and vector diseases	K3						
	CO4: Gain the knowledge about on pathology	K3						
	CO5: Know about bacterial and viral diseases	K3						

**Learning Resources**

Text Books	1. Mukherjee, K.L. and Anuradha, C. 2017. Medical Laboratory Technology Vol. I, II, III. Tata McGraw Hill Publishing Ltd., New Delhi.
Reference Books	1. Ramnik, S. 2006. Textbook of Medical Laboratory Technology. 1 <sup>st</sup> edition. Jaypee Brothers Medical Publishers, New Delhi.
Website Link	1. <a href="https://bit.ly/3UnLCm2">https://bit.ly/3UnLCm2</a> 2. <a href="https://bit.ly/2Ha0Jbr">https://bit.ly/2Ha0Jbr</a>

L-Lecture

T-Tutorial

P-Practical

C-Credit

B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards									
Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C	
21MSUZOE03	MEDICAL LABORATORY TECHNIQUES	ELECTIVE - III	V	4	4	0	0	4	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	L	M	S	S	M	M	M
CO2	S	M	S	L	S	S	S	S	M	S
CO3	S	M	M	M	M	S	S	S	S	S
CO4	S	L	M	M	L	S	S	M	M	M
CO5	S	L	M	M	M	S	M	S	L	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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Tutorial Schedule	5. Interactive sessions 6. Quiz
Teaching and Learning Methods	11. Lectures 12. Discussions 13. Presentation 14. Mind mapping 15. Field visit
Assessment Methods	7. Unit test 8. Assignment 9. Internal exam evaluation

Designed By	Verified By	Approved By
Dr. D. AMERASAN	Dr. D. SUGANYA	

(Dr. S. SHANTHA)



**B.Sc., Zoology Syllabus LOCF- CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOE04	AQUACULTURE	ELECTIVE-IV	VI	4	4	0	0	4
<b>Objective</b>	To understand the importance and types of aquaculture							
<b>Unit</b>	<b>Course Content</b>						<b>Knowle dge Levels</b>	<b>Sessio ns</b>
I	Definition- History of aquaculture- Scope and importance of aquaculture - Principles of site selection for various kinds of fish farms. Characters and other parameters- water and soil.						K1	10
II	Types of aquacultures - Monoculture, Poly culture, Integrated farming, Culture Method- Pond culture, Pen and Cage culture, Raft culture, Race way culture, Warm and cold-water fish culture						K1-K2	15
III	Criteria for selection of variety - Seed procurement and stocking management. Water quality management. Aquatic weeds and their Control-Types of weeds, weed control-manual, mechanical, chemical and Biological.						K2-K3	10
IV	Nutritional requirements and formulation of artificial diets. Breeding and culture of fresh water fishes - Catla, <i>Mrigala</i> , Rohu and Tilapia.						K3	10
V	Mari culture - Culture of edible oyster, pearl oyster, mussels, clams, sea urchins and sea weeds						K3	10
<b>Course Outcome</b>	After the completion of course, students will be able							
	CO1: To understand the Scope and importance of aquaculture						K1	
	CO2: To describe different types of aquaculture practices						K2-K2	
	CO3: To define the criteria for selection and acquire knowledge about the aquatic weeds						K2-K3	
	CO4: To know about nutritional requirements and feed formulation for aquaculture organisms						K3	
	CO5: To acquire knowledge on Mariculture						K3	
<b>Learning Resources</b>								
<b>Text Books</b>	1. Jhingran V.G. (1982). Fish and Fisheries in India. Hindustan Publishing Corporation, New Delhi. 2. Stickney, Robert R., (2017) Aquaculture an Introductory Text. CABI Publisher							
<b>Reference Books</b>	1. Reddy, M.S., (2004). Textbook of Aquaculture. Discovery Publishing Pvt. Ltd., India. 2. Annan, J.F. Smiteman, R.O. Tehebenogous G. (1983) Principles and practices of Pond Aquaculture, Oregon State University, U.S.A.							
<b>Website Links</b>	1. <a href="https://bit.ly/3oFDRfz">https://bit.ly/3oFDRfz</a> 2. <a href="https://bit.ly/41O4L2Q">https://bit.ly/41O4L2Q</a>							

L-Lecture

T-Tutorial

P-Practical

C-Credit

B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOE04	AQUACULTURE	ELECTIVE-IV	VI	4	4	0	0	4

CO-PO Mapping

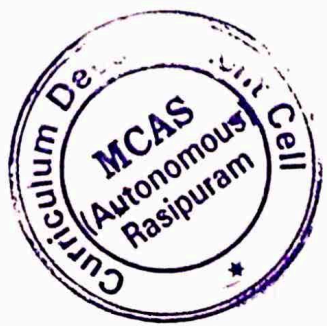
CO No.	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	S	M	S	M	S	M	M	M
CO2	M	M	S	S	M	M	L	M	S	S
CO3	L	S	M	S	S	S	M	S	S	M
CO4	M	S	L	M	M	S	M	M	S	S
CO5	M	L	S	M	M	S	S	M	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
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<b>Tutorial Schedule</b>	
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Discussions</li> <li>3. Interactive sessions</li> <li>4. Presentation</li> <li>5. Mind mapping</li> <li>6. Field visit</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>1. Unit test</li> <li>2. Assignment</li> <li>3. Internal exam evaluation</li> </ol>

Designed By	Verified By	Approved By
Dr.V.VINITA VINJOY JERUSHA <i>V. Vinjoy W</i>	Dr.D.SUGANYA <i>[Signature]</i>	<i>[Signature]</i>

(Dr. S. SHANTHA)



**B.Sc., Zoology Syllabus LOCF- CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZ0E05	WILDLIFE BIOLOGY	ELECTIVE-V	VI	4	4	0	0	4

**Objective** To understand the concept of wildlife biology

Unit	Course Content	Knowledge Levels	Sessions
I	Wildlife Biology - Wildlife conservation - Rare, Endangered, Threatened and Endemic Species - India as a mega wildlife diversity country.	K1-K2	10
II	Forest types in India - Sylvicultural systems - Agro forestry systems - Indian Forest Acts	K1-K2	8
III	Instinctive behaviour - Biological rhythms - Types of animal communications - Social behaviour in animals	K1-K3	8
IV	Wildlife census techniques - Human wildlife conflict - Basic concepts, reasons for conflicts, Identification of damages caused by wild animals and control measures.	K1-K3	10
V	Infectious and Non-infectious diseases of wild animals	K1-K3	8
<b>Course Outcome</b>	After the completion of course, students will be able		
	CO1: To understand the wildlife biology and conservation	K1-K2	
	CO2: To acquire knowledge about types of Forest in India, Sylvicultural systems and Indian Forest Acts	K1-K2	
	CO3: To understand the animal behaviors	K1-K3	
	CO4: To acquire knowledge about Wildlife census techniques	K1-K3	
	CO5: To gain knowledge about Infectious and noninfectious wildlife diseases	K1-K3	

**Learning Resources**

<b>Text Books</b>	<ol style="list-style-type: none"> <li>Singh, S.K. 2020. Textbook of Wildlife Management. 3<sup>rd</sup> edition. CBS Publisher, U.S.A,</li> <li>Goutam, K.S. and Mazumdar, S. 2017. Wildlife Biology: An Indian Perspective. PHI Learning Publisher, India.</li> </ol>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>Saharia, V.B. 1982. Wildlife in India, Nataraj Publishers, Dehra Dun</li> <li>Seshadri, B. 1986 India's Wildlife reserves, Sterling Publishers Pvt. Ltd., New Delhi</li> <li>Giles, R.H. 1984. Wildlife Management Techniques 3<sup>rd</sup> edition. The wildlife Society, Washington. D.C. Nataraj Publishers, Dehradun. India</li> </ol>
<b>Website Links</b>	<ol style="list-style-type: none"> <li><a href="https://bit.ly/41t5fM4">https://bit.ly/41t5fM4</a></li> <li><a href="https://bit.ly/41I0JJU">https://bit.ly/41I0JJU</a></li> </ol>

**L-Lecture T-Tutorial P-Practical C-Credit**

B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZ0E05	WILDLIFE BIOLOGY	ELECTIVE-V	VI	4	4	0	0	4

L-Lecture T-Tutorial P-Practical C-Credit

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	L	M	S	M	S	M	M
CO2	M	S	M	M	M	S	S	S	S	L
CO3	S	M	S	L	M	S	M	M	M	M
CO4	S	S	M	S	S	S	M	S	S	M
CO5	S	M	S	M	S	L	S	S	S	M
Level of Correlation between CO and PO			L-LOW			M-MEDIUM			S-STRONG	

Tutorial Schedule

Teaching and Learning Methods	<ol style="list-style-type: none"> <li>Lectures</li> <li>Discussions</li> <li>Interactive sessions</li> <li>Presentation</li> <li>Mind mapping</li> <li>Field visit</li> </ol>
Assessment Methods	<ol style="list-style-type: none"> <li>Unit test</li> <li>Assignment</li> <li>Internal exam evaluation</li> </ol>



Designed By	Verified By	Approved By
Dr.M.PRABU <i>M. Prabu</i>	Dr.D.SHGANYA <i>D. Shganya</i>	<i>[Signature]</i>

*[Signature]*  
*[Signature]*

B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C	
21M6UZOE06	PARASITOLOGY	ELECTIVE-VI	VI	4	4	0	0	4	
Objective	To gain knowledge about the organs of animals and their physiological functions								
Unit	Course Content							Knowledge Levels	Sessions
I	Introduction to Parasitology - Brief introduction of Parasitism, Parasite, Parasitoid and Vectors (mechanical and biological vector).							K1	10
II	Parasitic Protozoa Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of <i>Entamoeba histolytica</i> , <i>Giardia intestinalis</i> , <i>Trypanosoma gambiense</i> , <i>Leishmania donovani</i> , <i>Plasmodium vivax</i> Parasitic Vertebrates; A brief account of parasitic vertebrates; Cookicutter Shark, Candiru, Hood Mockingbird and Vampire bat.							K1-K2	8
III	Classification and identification of common ecto- and endo-parasites of sheep, goat, cattle, swine, horse, fowl, ducks, dog, cats, rabbits, mice.							K2-K3	8
IV	Parasitic Nematodes: Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of <i>Ascaris lumbricoides</i> , <i>Ancylostoma duodenale</i> , <i>Wuchereria bancrofti</i> and <i>Trichinella spiralis</i> . Study of structure, life cycle and importance of Meloidogyne (root knot nematode), Pratylenchus (lesion nematode)							K3	10
V	Parasitic Arthropoda Biology, importance and control of ticks, mites, <i>Pediculus humanus</i> (head and body louse), <i>Xenopsylla cheopis</i> and <i>Cimex lectularius</i>							K3	8
Course Outcome	After the completion of course, students will be able to								
	CO1: Understand what parasitism means							K1	
	CO2: Acquire knowledge about the diagnosis and treatment of various diseases							K1-K2	
	CO3: Differentiate ecto and endo parasites							K2- K3	
	CO4: Learn about the Parasitic Nematodes							K3	
	CO5: Know about the Parasitic Arthropoda							K3	
Learning Resources									
Text Books	1. C P Baveja, V Baveja., 2021.Parasitology. Arya publishing company, New Delhi								
Reference Books	1. ARORA, D. R. 2020. Medical Parasitology., Fifth Edition., CBS Publisher and Distributer Pvt. Ltd., Hill. 2. ChatterjeeK. D., Parasitology (protozoology and Helminthology)., Thirteenth Edition., BBS Publications								
Website Links	1. <a href="https://bit.ly/41O5H7m">https://bit.ly/41O5H7m</a> 2. <a href="https://bit.ly/41B7H3c">https://bit.ly/41B7H3c</a>								

**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOE06	PARASITOLOGY	ELECTIVE-VI	VI	4	4	0	0	4
Objective	To gain knowledge about the organs of animals and their physiological functions							
Unit	Course Content						Knowledge Levels	Sessions
I	Introduction to Parasitology - Brief introduction of Parasitism, Parasite, Parasitoid and Vectors (mechanical and biological vector).						K1	10
II	Parasitic Protozoa Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of <i>Entamoeba histolytica</i> , <i>Giardia intestinalis</i> , <i>Trypanosoma gambiense</i> , <i>Leishmania donovani</i> , <i>Plasmodium vivax</i> Parasitic Vertebrates; A brief account of parasitic vertebrates; Cookicutter Shark, Candiru, Hood Mockingbird and Vampire bat.						K1-K2	8
III	Classification and identification of common ecto- and endo-parasites of sheep, goat, cattle, swine, horse, fowl, ducks, dog, cats, rabbits, mice.						K2-K3	8
IV	Parasitic Nematodes: Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of <i>Ascaris lumbricoides</i> , <i>Ancylostoma duodenale</i> , <i>Wuchereria bancrofti</i> and <i>Trichinella spiralis</i> . Study of structure, life cycle and importance of Meloidogyne (root knot nematode), Pratylenchus (lesion nematode)						K3	10
V	Parasitic Arthropoda Biology, importance and control of ticks, mites, <i>Pediculus humanus</i> (head and body louse), <i>Xenopsylla cheopis</i> and <i>Cimex lectularius</i>						K3	8
Course Outcome	After the completion of course, students will be able to							
	CO1: Understand what parasitism means						K1	
	CO2: Acquire knowledge about the diagnosis and treatment of various diseases						K1-K2	
	CO3: Differentiate ecto and endo parasites						K2- K3	
	CO4: Learn about the Parasitic Nematodes						K3	
	CO5: Know about the Parasitic Arthropoda						K3	
Learning Resources								
Text Books	1. C P Baveja, V Baveja., 2021.Parasitology. Arya publishing company, New Delhi							
Reference Books	1. ARORA, D. R. 2020. Medical Parasitology., Fifth Edition., CBS Publisher and Distributer Pvt. Ltd., Hill. 2. ChatterjeeK. D., Parasitology (protozoology and Helminthology)., Thirteenth Edition., BBS Publications							
Website Links	1. <a href="https://bit.ly/41O5H7m">https://bit.ly/41O5H7m</a> 2. <a href="https://bit.ly/41B7H3c">https://bit.ly/41B7H3c</a>							



**B.Sc., Zoology Syllabus LOCF - CBCS with effect from 2021-2022 onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOE06	PARASITOLOGY	ELECTIVE-VI	VI	4	4	0	0	4

**CO-PO Mapping**

CO. No.	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	M	L	M	S	S	M	S	M
CO2	M	M	S	M	M	S	S	S	M	M
CO3	S	M	S	M	L	S	S	S	M	S
CO4	S	M	M	S	S	S	M	S	S	S
CO5	S	M	S	M	S	S	S	S	M	S
Level of Correlation between CO and PO		L-LOW			M-MEDIUM			S-STRONG		

<b>Tutorial Schedule</b>	<ol style="list-style-type: none"> <li>Interactive sessions</li> <li>Quiz</li> </ol>
<b>Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>Lectures</li> <li>Discussions</li> <li>Presentation</li> <li>Mind mapping</li> <li>Field visit</li> </ol>
<b>Assessment Methods</b>	<ol style="list-style-type: none"> <li>Unit</li> <li>Assignment</li> <li>Internal exam evaluation</li> </ol>

Designed By	Verified By	Approved By
Dr. V. VINITA VINJOY JERUSHA <i>Vita Vinjoy CV</i>	Dr. D. SUGANYA <i>[Signature]</i>	<i>[Signature]</i> Dr. S. S. S. S. S.



**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOPR1	PROJECT WORK	PROJECT WORK	VI	4		-	4	4
Objective	<ul style="list-style-type: none"> <li>To inculcate/impart skills on project design, experimental execution and research reporting</li> <li>To enhance their skills as on writing a dissertation</li> </ul>							
Details	Course Content						Knowledge Levels	Sessions
Format for the preparation of the Project Report	The final stage of work consists of the 1. Title Page 2. Bonafide Certificate 3. Acknowledgement 4. Table of contents 5. List of tables and figures 6. Abbreviation						K1- K2	
Text of the Project	The following structure of project work should be followed to maintain the uniformity in preparation and presentation. <b>Chapter 1 - Introduction</b> This chapter explains the selection of the topic and its relevance, definitions of related aspects, characteristics, different concepts pertaining to the topic etc can be covered by the candidate. <b>Chapter 2 - Aim and Objectives</b> This chapter describes the primary goal of the project, how it intends to accomplish it. <b>Chapter 3 - Review of Literature</b> This chapter gives clear cut information about studies done on the respective topic/research. This would assist students to undertake further study on the same topic/research. <b>Chapter 4 - Materials and Methods</b> This chapter is the vital component of the topic/research. It describes all the procedures and methods used for their work in detail with flow charts. <b>Chapter 5- Result and Discussion</b> This chapter presents the Research Findings and Interpret their work with the previous research findings. Results tables and figures to be in colour. <b>Chapter 6- Summary</b> The chapter provides as the overview of the key research findings If required, more chapters of data analysis could be						K3- K4	

	added. <b>7. Bibliography</b>		
	<b>Typing</b> <b>Instruction:</b> <b>Paper:</b> 8 ½ * 11 inches in size. Only one side of the sheet should be typed. <b>Margin:</b> The left side margin should not be less than 1.5 inches (or 40 mm) the right, top and Bottom Margin one inch (or 25 mm). <b>Font:</b> Times New Roman, subject matter -12 font size in running format, Heading and Section headings should be capitalized - 14 font size and line space is 1.5.		
<b>Headings and Titles</b>	1. Heading and Section headings should be capitalized and centered- 14 font sizes with Bold. 2. Subdivision headings should be typed from the left hand margin sentence case -12 font sizes with Bold. 3. Paragraphs should be indented seven space for pica type and nine for elite type.		
<b>Tables and Figures</b>	1. The table number (E.g. Table.1 : / Figure.1 : /Graph. 1:) typed in capitals should be separated from the text by two or three spaces. 2. An asterisk should be used if an explanatory note to a time is necessary. 3. The note should be placed immediately below the table.		
	<b>Line Spacing:</b> The text of the thesis should be 1.5 lines spacing <b>Pagination:</b> Pages of the text are numbered continuously in Arabic numerals.		
	<b>Bibliography</b> Any works of other researchers, if used either directly or indirectly, should be indicated at appropriate places in the report/thesis. The citation may assume any one of the following forms. APA Style. APA in-text citation style uses the author's last name and the year of publication, for example: Kuby, 2005/Verma and Agarwal, 2005/Verma et al., 2005. <b>For citing Books</b> Fuller,C. (2019) Platelets. Cambridge: Biostate Publishing. p 33-39. <b>Citing Journal</b> Abdullah, M., Atta, A., and Allohedan, H. (2018) Green synthesis of hydrophobic magnetite nanoparticles coated with plant extract and their application as petroleum oil spill collectors. <i>Nanomaterials</i> , 8(1):855-859.	K5	

**B.Sc., Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
21M6UZOPR1	PROJECT WORK	PROJECT WORK	VI	4		-	4	4

**CO-PO Mapping**

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	M	L	L	L	M	S	S	S
CO2	S	S	S	S	L	M	S	S	S	S
CO3	S	S	S	S	L	S	S	S	M	M
CO4	S	S	S	M	L	S	S	S	M	M
CO5	M	M	M	S	L	M	M	S	L	S
Level of Correlation between CO and PO						L-LOW	M-MEDIUM	S-STRONG		

<b>Tutorial Schedule</b>	-
<b>Teaching and Learning Methods</b>	-
<b>Assessment Methods</b>	1. Review Meeting I- 15 Marks 2. Review Meeting II- 15 Marks 3. Attendance- 5 Marks 4. Student Work Diary - 5 Marks
	1. Project Presentation - 40 Marks 2. Viva-Voce - 60 Marks

<b>Designed By</b>	<b>Verified By</b>	<b>Approved By</b>
Dr. AMARESAN	Dr. D. SUGANYA	



**B. Sc., Zoology– Zoology for Competitive Examination Syllabus - LOCF - CBCS - Pattern with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M6UZ00E1	Zoology for Competitive Examination	Self-study Online-Competitive Examination	VI	-	-	-	-	2
<b>Objective</b>	To identify problem related to their area of interest in Zoology, enhance problem solving skills and research knowledge.							
<b>Details</b>	<b>Course Content</b>	<b>Knowledge Levels</b>	<b>Sessions</b>					
	<p>Assemblage of different topics related to Zoology in particular. Invertebrate, Chordate. Animal Physiology, Developmental Biology, Genetics, Cell Biology, Molecular Biology, Microbiology, Immunology, Sericulture, Apiculture, Vermiculture, Poultry Science, Pisciculture, etc. Major emphasis has been put forth to include recent developments in the subjects. This course aims to give a holistic view of all the topics which comprised of some factual text points, multiple choice questions (MCQ). it is extremely suitable for students pursuing their higher degree in University/Institute for their entrance exams, students preparing for various national and state level competitive entrance exams to get admission in higher education in Zoology. In addition, it is also useful for CSIR, TNPSC, UPSC, ICAR, ICMR, etc.</p> <p><b>Rules for creating MCQ pattern.</b></p> <ol style="list-style-type: none"> <li>Objective type online examination will be conducted at the end of 6<sup>th</sup> semester.</li> <li>Questions must be taken from all previous question papers of CSIR, TNPSC, UPSC, ICAR, ICMR, etc.</li> <li><b>Test critical thinking.</b></li> </ol> <p>Multiple choice questions to test the superficial knowledge. Learners to interpret facts, evaluate situations, explain cause and effect, make inferences, and predict results.</p> <p><b>4. Emphasize Higher-Level Thinking</b></p> <p>Use memory-plus application-oriented questions. These questions require students to recall principles, rules or facts in a real-life context.</p>							

**5. Mix up the order of the correct answers**

Keep correct answers in random positions and don't let them fall into a pattern that can be detected

**6. Use a Question Format**

Multiple-choice items to be prepared as questions (rather than incomplete statements)

Incomplete Statement Format:

The capital of California is in Direct Question Format----- Less effective.

In which of the following cities is the capital of California? - This is best format.

**7. Keep Option Lengths Similar**

Avoid making your correct answer the long or short answer

**8. Avoid the "All the Above" and "None of the Above" Options**

Students merely need to recognize two correct options to get the answer correct

9. HOD's instruct to the faculty to prepare minimum 500 questions booklet (cumulatively for each programme) with solutions and circulate among the students.

10. Each Department to prepare the Questions (MCQ pattern with four answers) and submit to ICT.

<b>Course Outcome</b>	CO1: Identification of pattern of questions asked in competitive exams	K2
	CO2: Analyze the topics that are repeated in competitive exams	K4
	CO3: Able to categorize the topics and select the topics of their interest	K4
	CO4: Ability to solve problems related to each topic	K5
	CO5: Get confidence about appearing for competitive exams	K6

**Learning Resources**

<b>TextBooks</b>	<ol style="list-style-type: none"> <li>1. Agarwal V.K. 2016. Zoology for Degree Students. First edition. S.Chand, Publishing, India.</li> <li>2. Osborns, H. 2021. Economic Zoology: an Introductory Text-book in Zoology, With Special Reference to Its Applications in Agriculture, Commerce, and Medicine. Legare Street Press, India.</li> </ol>
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<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Ruppert and Barnes, R.D. (2006). Invertebrate Zoology, VIII Edition. Holt Saunders International Edition.</li> <li>2. Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). The Invertebrates: A New Synthesis, III Edition, Blackwell Science</li> <li>3. Barrington, E.J.W., 2012, Invertebrate structure and function. Boston – Houghton. Mifflin and ELBS, London.</li> <li>4. Waterman, Allyn J. et al., 1971. Chordate Structure and Function, Mac Millan &amp; Co., New York.</li> <li>5. Burke, Jack. D., 1970. Cell Biology, Scientific Book Agency, Calcutta.</li> </ol>
<b>Website Link</b>	<ol style="list-style-type: none"> <li>1. <a href="https://bit.ly/3kABzKa">https://bit.ly/3kABzKa</a></li> <li>2. <a href="https://bit.ly/3hVv96q">https://bit.ly/3hVv96q</a></li> <li>3. <a href="https://bit.ly/3kqTfYz">https://bit.ly/3kqTfYz</a></li> <li>4. <a href="https://bit.ly/3Av1Ejg">https://bit.ly/3Av1Ejg</a></li> <li>5. <a href="https://bit.ly/3tXwDSB">https://bit.ly/3tXwDSB</a></li> <li>6. <a href="https://bit.ly/3tWNpRX">https://bit.ly/3tWNpRX</a></li> <li>7. <a href="https://bit.ly/3AuYR9M">https://bit.ly/3AuYR9M</a></li> </ol>

**B. Sc., Zoology – Zoology for Competitive Examination Syllabus - LOCF - CBCS - Pattern with effect from 2021-2022 Onwards**

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M6UZO OE1	Zoology for Competitive Examination	Self-study Online-Competitive Examination	VI	-	-	-	-	2

**CO-PO Mapping**

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	M	S	L	S	S	S
CO2	S	S	M	M	M	S	L	M	S	S
CO3	S	M	S	S	S	S	M	M	S	S
CO4	S	M	M	S	M	S	L	S	S	S
CO5	S	S	M	S	S	S	M	S	M	S
Level of Correlation between CO and PO				L-LOW		M-MEDIUM		S-STRONG		

<b>Tutorial Schedule</b>	CSIR, TNPSC, UPSC, ICAR, ICMR, etc., previous year question papers with solutions – online mock test
<b>Teaching and Learning Methods</b>	Self-study, Group discussion, Chalk and Talk, Audio-Video Learning, learning through mock test
<b>Assessment Methods</b>	100 multiple choice questions through computer based online examinations passing minimum is 50%

Designed By	Verified By	Approved By
Dr.M.PRABU <i>M. Prabu</i>	Dr.D.SUGANYA <i>[Signature]</i>	<i>[Signature]</i> Dr. S. Suganya

