

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous College)

Affiliated to Periyar University, Salem | Accredited by NAAC with 'A' Grade

Recognized by UGC under Section 2(f) & 12 (B)



ESTD-1994

**MUTHAYAMMAL
COLLEGE OF ARTS
AND SCIENCE**

(Autonomous)

A UNIT OF VANETRA GROUP

Learn.
Lead

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DEGREE OF BACHELOR OF SCIENCE

Learning Outcomes – Based Curriculum Framework

– Choice Based Credit System

Syllabus for B.Sc., Zoology (Semester Pattern)

(For Candidates admitted from the academic year
2021 -2022 and onwards)

MUTHAYAMMAL COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)

A Unit of VANETRA Group

(Affiliated to Periyar University, Salem-11, Accredited with 'A' Grade by NAAC

UGC Recognized 2(f) & 12(B) status

Rasipuram-637 408, Namakkal Dt. Tamilnadu, India

VISION

To redefine the scope of higher education by infusing into each of our pursuits, initiatives that will encourage intellectual, emotional, social and spiritual growth, thereby nurturing a generation of committed, knowledgeable and socially responsible citizens.

MISSION

- To ensure State of the world learning experience
- To espouse value based Education
- To empower rural education
- To instill the spirit of entrepreneurship and enterprise
- To create a resource pool of socially responsible world citizens

DEPARTMENT OF ZOOLOGY

VISION

To nourish and cherish the lofty values of life through sterling scientific practices and imbibe a spirit that converts the Society to be hale and healthy

MISSION

- To magnetize the students to modern frontiers of Science
- To develop an ardent vigour for deciphering the fathom of nature and its rich biodiversity

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO1: Graduates will be able to promote learning environment to meet the industry expectation.

PEO2: Graduates will be incorporated the critical thinking with good

Communication and Leadership skills to become a self-employed

PEO3: Graduates will be uphold the human values and environmental sustenance

for the betterment of the society.

GRADUATE ATTRIBUTES

The Graduate attributes of B.Sc., Zoology are

GA 1 : Analytical Reasoning

GA 2 : Critical Thinking

GA 3 : Problem Solving Skills

GA 4 : Communication Skills

GA 5 : Leadership Quality

GA 6 : Team work

GA 7 : Lifelong Learning

UG PROGRAMME OUTCOMES (PO)

PO1 : To obtain the basic knowledge on taxonomy of animal sciences

PO2 : To gain the knowledge of structure and function of cell and molecular mechanisms

PO3 : To acquire the knowledge about on agro based Small and large scale industries like sericulture and Apiculture.

PO4 : To understand the basic tenets of genes and its mechanisms

PO5 : To correlate the dairy based animal rearing and its economic importance's

PO6 : To gain the knowledge about on the stages of animal developments, physiological functions, neurological functions and its disorders, immunological process and basic animal techniques.

PO7 : To acquire the knowledge on small and large scale production of aquaculture and its economic importance, Vermiculture and its agro based applications.

PO8 : To gain the knowledge on animal evolution, fundamentals of medical and its management.

PO9 : To correlates the basic concept of biostatistics and bioinformatics tools.

PO10 : To understand the knowledge about on rearing techniques and its economical importance of poultry.

PROGRAMME SPECIFIC OUTCOMES (PSO)

- PSO1 : To gather the relevant information about on Invertebrata, chordate, cell and molecular biology, genetics, developmental biology, physiology, biochemistry, Immunotechnology, evolutionary biology and neurobiology.
- PSO2 : Correlated the systematic view of plants and basic concepts of chemistry.
- PSO3 : Understand the application and economic values of dairy, sericulture, apiculture, Vermitechnology and poultry science.
- PSO4 : To gain the knowledge of techniques and tools on animal biotechnology, medical laboratory techniques, biostatistics and bioinformatics.
- PSO5 : To contribute the knowledge and economic development to the society.

DEFINITION

Programme

Programme” means core degrees offered in various disciplines.

Course

“Course” refers to the courses offered under the degree programme spread over the complete Programme of study as under.

Part I - means “Tamil/other languages” offered under the programme.

Part II - means “English” language offered under the programme.

Part III - means “the core subjects” related to the programme concerned including Practical’s.

Part III Allied - means “Allied subjects” offered as allied, which is interdisciplinary in nature but related to the programme.

Part III Electives - means “Elective subjects” related to the core subjects of the Programme concerned.

Part IV

(i) - “Non-Major Electives” means option is being given to students who do not come under the above two categories (i & ii).

(ii) - Skill based subject means the courses offered under the programme related to Advanced Skill acquisition for industrial application for which a separate Diploma will be awarded along with the Degree.

Syllabus for B. Sc., Zoology

(iii) - “Foundation Course” means courses offered as

1) Environmental Studies (1 year)

2) Value Education - Human Rights \Women's Rights(2nd year)

Part V - “Extension Activities” means all those activities which form a part of NSS/NCC/Sports/YRC and other co and extracurricular activities. A detailed explanation of the above with relevant credits are given under the “Scheme of Examination along with Distribution of Marks and Credits”

Duration

Means the stipulated years of study to complete a programme as prescribed by the University time to time. Currently for the undergraduate programme the duration of study is THREE years. These regulations apply to the regular course of study in approved institutions of the University.

Credits

Credits Means the weightage given to each course of study (subjects) attributed by the experts of the Board of Studies concerned.

Credit System

Credit system Means, the course of study under this pattern, where weightage of credits are spread over to different semesters during the period of study and the Cumulative Grade Point Average will be awarded based on the credits earned by the students. The following are the total credit points:

For Undergraduate Programme (Three years): 152

Eligibility norms for Admission

Candidate for admission to the first year of the degree of Bachelor of Science Course shall be required to have passed the Higher secondary examination (Academic or Vocational Stream) conducted by the Government of Tamil Nadu or an Examination accepted by the Syndicate, Subject to such conditions may be prescribed therefore shall be permitted to appear and qualify for B.Sc., degree examination in Zoology.

Duration of the Course

The course for the degree of Bachelor of Science shall consist of three academic years divided into six semesters. Each semester consists of 90 working days.

Passing Minimum

The candidate shall be declared to have passed the examinations if he /she secure not less than 40 marks.

UG-REGULATION

1.Internal Examination Marks- Theory

Components	Marks
CIA I&II	15
Attendance	5
Assignment	5
Total	25

Attendance Percentage	Marks
96 %to 100%	5
91%to 95%	4
86%to 90%	3
81%to 85%	2
75%to 80%	1
Below 75%	0

2. QUESTIONPAPERPATTERNFORCIA I,II AND ESE(3HOURS) MAXIMUM:75Marks

SECTION-A (10 Marks) (Objective Type)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

(10 x1=10 marks)

SECTION-B(10 Marks)(Short Answer)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

(5 x 2 = 10 marks)

SECTION-C (25 Marks)(Either or Type)

Answer any **FIVE** questions

ALL Questions Carry **EQUAL** Marks

Either or Type.(5 x 5 = 25 marks)

SECTION-D (30 Marks)(Analytical Type)

Answer any **THREE** Questions out of **FIVE** questions

ALL Questions Carry **EQUAL** Marks

(3 x 10 = 30 marks)

(Syllabus for CIA-I 2.5 Unit ,Syllabus for CIA-II All 5 Unit)

Syllabus for B. Sc., Zoology

2a) Components for Practical CIA.

Components	Marks
CIA –I	15
CIA - II	15
Observation Note	5
Attendance	5
Total	40

2.b) Components for Practical ESE.

Components	Marks
Completion of Experiments	50
Record	5
Viva	5
Total	60

3. Guidelines for Value Education Yoga and Environmental Studies (Part IV)

- The Course Value Education Yoga is to be treated as 100% CIA course which is offered in I Semester for I year UG students.
- The Course Environmental Studies is to be treated as 100% CIA course which is offered in II Semester for I year UG students.
- Total Marks for the Course = 100

Components	Marks
Two Tests(2 x30)	60
Field visit and report(10+10)	20
Two assignments(2 x10)	20
Total	100

Syllabus for B. Sc., Zoology

The passing minimum for this course is 40%

- In case, the candidate fails to secure 40% passing minimum, he/she may have to reappear for the same in the subsequent odd/even semesters.

4. Guidelines for Extension Activity (Part V)

- At least two activities should be conducted within semester consisting of two days each.
- The activities may be Educating Rural Children, Unemployed Graduates, Self Help Group etc.

The marks may be awarded as follows

No of Activities	Marks
2 x 50 (Each Activity for two days)	100

5. Internship/Industrial Training, Mini Project and Major Project Work

Internship/Industrial Training		Mini Project	Major Project Work	
Components	Marks	Marks	Components	Marks
CIA * ²			CIA	
Work Diary	25	-	a) Attendance 10 Marks	
Report	50	50	b) Review 30 Marks	40
Viva-voce	25	50	/Work Diary* ¹	
Total	100	100	ESE * ²	
			a) Final Report 40 Marks	
			b) Viva-voce 20 Marks	60
			Total	100

*¹Review is for Individual Project and Work Diary is for Group Projects (Group consisting of minimum 3 and maximum 5)

*²Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

Syllabus for B. Sc., Zoology

6. Guidelines for Competitive Exams- Online Mode (PartIII)- Online Exam 3 hours

Components	Marks
100 Objective Type Questions 100*1=100 Marks	100

Objective type Questions from Question Bank.

- The passing minimum for this paper is 40%
- In case, the candidate fails to secure 40% passing minimum, he/she may have to reappear for the same in the subsequent semesters.



MUTHAYAMMAL
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& SCIENCE

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



SEM	PART	COURSE_CODE	TITLE OF THE COURSE	Hrs./W		CREDIT POINTS	MAX.MARKS		
				Lect.	Lab.		CIA	ESE	TOTAL
I	I	Z1M1UFTA01	TAMIL-I	5		3	25	75	100
I	II	Z1M1UCEN01	COMMUNICATIVE ENGLISH-I	5		3	25	75	100
I	III	Z1M1UZOC01	INVERTEBRATES	4		4	25	75	100
I	III	Z1M1UBOA01	ALLIED BOTANY I	4		4	25	75	100
I	III	Z1M2UZOP01	PRACTICAL : INVERTEBRATES & CHORDATA	-	3				
I	III	Z1M2UBOAP1	PRACTICAL : ALLIED BOTANY	-	3				
I	IV	Z1M1UVED01	YOGA	2		2	100		
I	IV	Z1M1UPEL01	PROFESSIONAL ENGLISH FOR LIFE SCIENCE - I	4		2	25	75	100
I			TOTAL	24	6	18	225	375	500
II	I	Z1M2UFTA02	TAMIL-II	5	-	3	25	75	100
II	II	Z1M2UCEN02	COMMUNICATIVE ENGLISH - II	5	-	3	25	75	100
II	III	Z1M2UZOC02	CHORDATA	4	-	4	25	75	100
II	III	Z1M2UBOA02	ALLIED BOTANY II	4	-	4	40	60	100
II	III	Z1M2UZOP01	PRACTICAL: INVERTEBRATES & CHORDATA	-	3	3	40	60	100
II	III	Z1M2UBOAP1	PRACTICAL: ALLIED BOTANY	-	3	3	40	60	100
II	IV	Z1M2UEVS01	ENVIRONMENTAL STUDIES	2	-	2	100		
II	IV	Z1M2UPEL02	PROFESSIONAL ENGLISH FOR LIFE SCIENCE - II	4		2	25	75	100
II			TOTAL	24	6	24	320	480	700

HEAD

Department of Zoology


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Tamilnadu, India


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MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)

RASIPURAM - 637 408,
NAMAKKAL DISTRICT.

III	I	21M3UFTA03	TAMIL-III	5	-	3	25	75	100
III	II	21M3UCEN03	COMMUNICATIVE ENGLISH - III	5	-	3	25	75	100
III	III	21M3UZOC03	CELL AND MOLECULAR BIOLOGY	5	-	5	25	75	100
III	III	21M3UCHA01	ALLIED- CHEMISTRY I	4	-	4	25	75	100
III	III	21M4UZOP02	PRACTICAL : CELL AND MOLECULAR BIOLOGY & GENETICS	-	3				
III	III	21M4UCHAP1	PRACTICAL: ALLIED CHEMISTRY	-	3				
III	III	21M3UZOS01	SERICULTURE	3	-	2	25	75	100
III	IV	21M3UBTN01	NMEC - I	2	-	2	25	75	100
III			TOTAL	24	6	19	150	450	600
IV	I	21M4UFTA04	TAMIL-IV	5	-	3	25	75	100
IV	II	21M4UCEN04	COMMUNICATIVE ENGLISH - IV	5	-	3	25	75	100
IV	III	21M4UZOC04	GENETICS	5	-	4	25	75	100
IV	III	21M4UCHA01	ALLIED-CHEMISTRY II	4	-	3	25	75	100
IV	III	21M4UZOP02	PRACTICAL: CELL AND MOLECULAR BIOLOGY & GENETICS		3	3	40	60	100
IV	III	21M4UCHAP1	PRACTICAL: ALLIED CHEMISTRY	-	3	3	40	60	100
IV	IV	21M4UZOS02	DAIRY SCIENCE	3	-	2	25	75	100
IV	IV	21M4UBTN02	NMEC - II	2	-	2	25	75	100
IV	III	21M4UZOIS1	INTERNSHIP			2	100		
IV			TOTAL	24	6	25	330	570	800
V	III	21M5UZOC05	DEVELOPMENTAL BIOLOGY	5	-	4	25	75	100
V	III	21M5UZOC06	ANIMAL PHYSIOLOGY	5	-	4	25	75	100
V	III	21M5UZOC07	IMMUNOLOGY AND MICROBIOLOGY	4	-	4	25	75	100
V	III	21M6UZOP03	PRACTICAL: DEVELOPMENTAL BIOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION	-	3				
V	III	21M6UZOP04	PRACTICAL: IMMUNOLOGY AND MICROBIOLOGY & ECOLOGY	-	3				
V	III	21M5UZOEO1	ELECTIVE - I	4	-	4	25	75	100
V	III	21M5UZOEO2	ELECTIVE - II	4	-	4	25	75	100
V	IV	21M5UZOS03	VERMITECHNOLOGY	2		2	25	75	100
V			TOTAL	24	6	22	150	450	600


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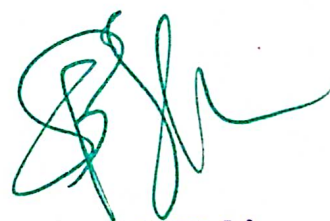

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 RASIPURAM - 637 408,
 NAMAKKAL DISTRICT

VI	III	21M6UZOC08	EVOLUTION	5	-	5	25	75	100
VI	III	21M6UZOC09	ECOLOGY	5	-	4	25	75	100
VI	III	21M6UZOEO3	ELECTIVE - III	4	-	4	25	75	100
VI	III	21M6UZOEO4	ELECTIVE - IV	4	-	4	25	75	100
VI	III	21M6UZOP03	PRACTICAL: DEVELOPMENTAL BIOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION	-	3	3	40	60	100
VI	III	21M6UZOP04	PRACTICAL: IMMUNOLOGY AND MICROBIOLOGY & ECOLOGY	-	3	3	40	60	100
VI	III	21M6UZOPR1	PROJECT WORK	-	4	4	40	60	100
VI	III	21M6UZOOE1	ZOOLOGY FOR COMPETITIVE EXAMINATIONS	-	-	2	100		
VI	IV	21M6UZOS04	POULTRY SCIENCE	2	-	2	25	75	100
VI	V	21M6UEXA01	EXTENSION ACTIVITY		-	1	100		
VI			TOTAL	20	10	32	445	555	800
VI			OVERALL TOTAL	140	40	140	1620	2880	4000
VI		21M6UZOEC1	MOOC COURSES OFFERED IN SWAYAM / NPTEL	-	-	2	-	-	-



HEAD

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RASIPURAM - 637 408,
NAMAKKAL DISTRICT.

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
21M1UZOC01	INVERTEBRATES	DSC THEORY - I	I	4	4	0	0	4
Objective	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
I	Phylum: Protozoa 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 Phylum: Porifera Type Study: <i>Leucosolenia botryoides</i> - External features- Body wall, Spicules, Nutrition, Reproduction. General Topic: Canal System in sponges.						K1-K2	10
II	Phylum: Coelenterata 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 Phylum: Helminthes 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.						K1-K2	8
III	Phylum: Annelida 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 Phylum: Arthropoda Type Study: <i>Macrobrachium rosenbergii</i> -External morphology, Appendages, Digestive system, Respiratory system, Reproductive system. General Topic: Larval forms of Crustacea						K1 -K2	8
IV	Phylum: Arthropoda 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,						K1-K3	9

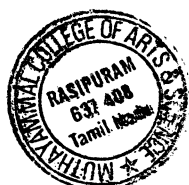
	Beneficial Insects.							
V	Phylum: Mollusca Type Study: <i>Pila globosa</i> - External features, Shell, Digestive system, Respiratory system, Circulatory system, Nervous system, Sense organs- Eyes, Osphradium, Statocyst, Tentacles, Excretory system. General Topic: Torsion in Mollusca. Phylum: Echinodermata 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.						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	
Learning Resources								
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. https://www.geeksforgeeks.org/coelenterata/ 2. https://bit.ly/3D12dFM							
	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
21M1UZOC01	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						

Tutorial Schedule	--
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

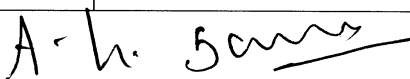


Designed By	Verified By	Approved By
[Dr. D. SUGANYA]	[Dr. M. SURESH KUMAR]	

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
21M1UBOA01	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 adaptatations 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	<p>1) Vashishta, B.R., Sinha, A.K AND Singh, V.P (2008) Botany for Degree Students: Algae. S.Chand & Company Ltd., New Delhi.</p> <p>2) Pandey, B.P. (2001) College Botany Vol. I: Algae, Fungi, Bacteria, Viruses, Plant pathology S.Chand & Company Ltd, New Delhi.</p>							
Reference Books	<p>1) Sharma O P (1989) Text Book of Fungi. Tata McGraw Hill, New York.</p> <p>2) Smith, G.M (1995) Cryptogamic Botany Vol. II Bryophytes and Pteridophytes (2nd Edn). Tata McGraw Hill Publishing Co., New Delhi.</p>							
Website Link	<p>https://swayam.gov.in/nd2_cec20_bt11/preview https://www.swayamprabha.gov.in/index.php/program/archive/9</p>							
	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
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											



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	DSC THEORY - II	II	4	4	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	Session	
I	Introduction to Chordata: 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.					K1-K3	10	
II	Pisces: 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					K1-K2	8	
III	Amphibia: 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 organization (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.					K1-K3	8	
IV	Aves: 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					K1-K3	9	


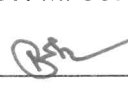
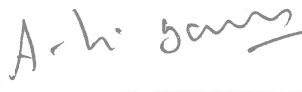
V	Mammalia: General characters and classification up to subclasses with the names of the examples. Type study: Rabbit -External morphology - Digestive system- Respiratory system-Heart-Structure of Brain-Reproductive system. General topics: 1. Egg laying mammals 2. Adaptations of aquatic mammals 3. Dentition in mammals	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 chordates	K1	
	CO2: Describe the unique characteristics of Urochordates, hemichordata and cephalochordates	K2	
	CO3: Explain the anatomical functions of the chordates to mammals.	K3	
	CO4: Acquire the knowledge about ecological role in different groups of chordates.	K3	
	CO5: Connect the importance of chordate to our real life	K3	
Learning Resources			
Text Books	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.		
Reference Books	1. Ayyar, E.K and T.N. Ananthakrishnan (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.		
Website Link	1. https://bit.ly/3TCxa8W 2. https://bit.ly/3AGqe1U		

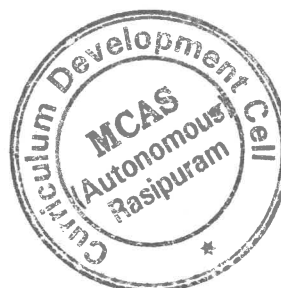
B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UZOC02	CHORDATA	DSC THEORY - II	II	4	4	0	0	5

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01	S	L	M	L	M	S	M	S	M	M
C02	S	L	M	M	M	S	S	S	M	L
C03	S	L	S	L	L	S	S	S	L	S
C04	S	S	M	S	S	S	M	S	S	M
C05	S	M	S	M	S	S	S	S	M	S
Level of Correlation between CO and PO	L-LOW	M-MEDIUM		S-STRONG						

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


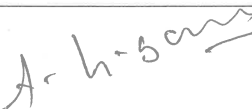
Designed By	Verified By	Approved By
Dr.D. SUGANYA 	Dr. M. SURESHKUMAR 	

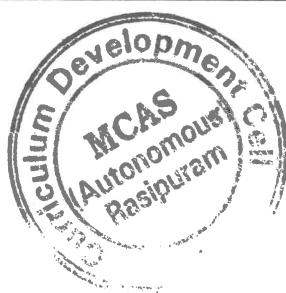


B.Sc-ZOOLOGY-ALLIED BOTANY-II- Syllabus LOCF-CBCS with effect from 2022-2023 Onwards

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



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 & CHORDATA	DSC PRACTICAL - I	II	3	0	0	3	3
Objective	To identify the anatomical characteristics of animals and classify of the ontogenic and phylogenetic relationships of Invertebrates and phylum Chordata.							
S.No.	List of Experiments / Programmes						Knowledge Levels	Sessions
1	Cockroach: 1. Digestive system 2. Nervous system						K1-K3	6
2	Prawn: 3. Nervous system						K1-K3	3
3	Any BonyFish: 4. Digestive system						K1-K3	3
4	MOUNTING a. Mouth parts of House fly, Honey bee, Mosquito b. Sting apparatus of Honey bee c. Scoliodon: Placoid scales.						K2	6
5	Classify giving reasons up to order: Paramecium, Aurelia, Fasciola, Ascaris, Lamellidens, Asterias, Balanoglossus, Herdmania (Ascidian), Branchiostoma (Amphioxus), Petromyzon, Scoliodon sorrakowah, Rana hexadactyla, Calotes versicolor, Columbalivia.						K1	3
6	Draw labeled sketches: Obelia medusa, Ephyra larva, Redia larva, Cercaria larva, Mysis larva, Alima larva, Bipinnaria larva Amphioxus-T.S. through pharynx. Doliolum, Salpa, Narcine, Cynoglossus, Alcedo atthis (King-fisher)						K1	3
7	Comment on Biological significance: Plasmodium, Obelia colony, Physalia, Velella, Fasciola - Miracidium, Taenia - Mature proglottid, Trochophore larva, Chaetopterus, Peripatus, Hirudinaria, Limulus, Chiton, Sepia, Octopus, Tornaria larva, Ascidian Tadpole larva, Anabas candens, Clarias batrachus, Hippocampus, Echeneis, Ichthyophis, Axolotl larva, Chamaeleon, Viperarusselli (Russel's viper), Draco volans, Dinopium (Woodpecker), Bat.						K1	3

8	Comment on Structure / Skeleton / Palate / Dentition: 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
Course Outcome	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	
Learning Resources			
Text Books	1. Practical Zoology- Invertebrates S.S. Lal, Rastogi publication, 7th Edition. 2. Manual of practical Zoology ,PS Verma, S CHAND Publication, 5th Edition		
Reference Books	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		
Website Link	1.https://bit.ly/3etEa7O 2. https://bit.ly/3Qc039d		


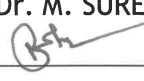
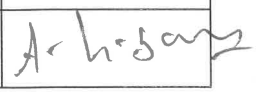
B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

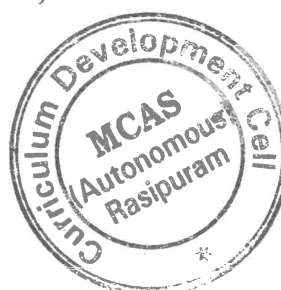
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UZOP01	PRACTICAL: INVERTEBRATES & CHORDATA	DSC PRACTICAL - I	II	3	0		3	3

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
C01	S	M	S	L	M	S	S	S	M	S
C02	S	M	S	S	S	S	S	S	M	M
C03	S	L	M	L	M	S	S	M	L	M
C04	S	L	M	L	M	S	S	S	M	M
C05	S	M	M	M	M	S	S	S	S	S
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 2. Observations of specimens 3. Virtual Dissections
Assessment Methods	1. Model practical's 2. Observation 2. Record 3. Observation

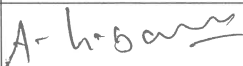
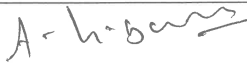
Designed By	Verified By	Approved By
Dr.D. SUGANYA 	Dr. M. SURESHKUMAR 	



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
Objective	Understand the characters of monocot and dicot plant families, gain knowledge on internal structure of various plant parts and learn economic Botany.					
S.No.	List of Experiments / Programmes					Knowledge Levels
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. Cicer arietinum - 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 coccinea - 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
Course Outcome	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

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=lgIhKWB1gc
ALLIED BOTANY PRACTICAL QUESTION MODEL	<p>ALLIED BOTANY PRACTICAL QUESTION MODEL</p> <ol style="list-style-type: none"> 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) <p>KEY</p> <ol style="list-style-type: none"> 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



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										



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
21M3UZOC 03	CELL AND MOLECULAR BIOLOGY	DSC THEORY - III	III	5	5			4
Objective	To analyze the structures and functions of basic components of cells and its molecular mechanism							
Unit	Course Content						Knowledge Levels	Sessions
I	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
II	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
III	Ultra Structure, chemical composition and functions: Mitochondria, Nucleus, Nucleolus, Chromosome-Heterochromatin, Euchromatin						K3	12
IV	Nucleic acids: DNA & RNA Ultrastructure & Types. Replication-Transcription- Translation- Principles of gene regulation, concept of operons, lac operon concept						K2-K3	12
V	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
Course Outcome	After completion of the course, students should be able to							
	CO1: Understand and appreciate the basic components of the cells and its observation tools						K1	
	CO2: Outline the structure and functions of cell organelles						K1	
	CO3: Analyze the ultra-structure and chemical composition of cell organelles						K2	
	CO4: Differentiate the structure and functions of DNA, RNA and its regulations						K3	
	CO5: Evaluate the formation of cancer cells and its properties						K3	
Learning Resources								
Text Books	1.DE Robertis E.D.P (2017) Cell and Molecular Biology, 8th Edition, Wolfe Publication							
Reference Books	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.							
Website Link	1. https://bit.ly/3cLjOqe 2. https://bit.ly/3KN5ABO 3. https://bit.ly/3BdNgyt							
	L-Lecture			T- Tutorial	P- Practical	C-Credit		

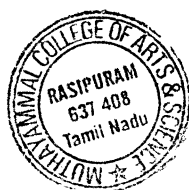
B.Sc.,-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Se m	Hours	L	T	P	C
21M3UZOC03	CELL & MOLECULAR BIOLOGY	DSC THEORY - III	III	5	5			4

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO 1	PSO2	PSO3	PSO 4	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 Correlatio n between CO and PO	L-LOW	M- MEDIUM		S- STR ONG						

Tutorial Schedule	--
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. 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	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
I	Introduction – Importance of sericulture– Mulberry plant - Classification of commercial varieties of mulberry. Mulberry plant cultivation practices.						K1	4
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
III	Tools of sericulture– cultural methods and management of mulberry silk worms - Silkworm rearing operations – Chawki rearing and late age rearing techniques.						K2	6
IV	Harvesting methods- Physical and commercial characters of cocoons. Reeling operations, importance of by – products of Sericulture.						K2-K3	7
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
Course Outcome	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								
Text Books	1. Ganga, G. (2003) comprehensive sericulture Vol-I, Moriculture – Oxford –IBH Puubl. Co. India							
Reference Books	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							
Website Link	1. https://bit.ly/3ReaWZg 2. https://bit.ly/3TLsXQa 3. https://bit.ly/3ASDgtc							
	L-Lecture			T- Tutorial	P- Practical	C- Credit		

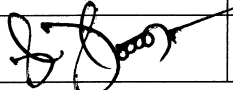
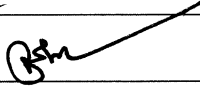
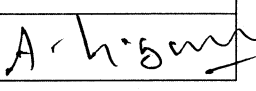
B.Sc.,-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
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						

Tutorial Schedule	--
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. D. AMARESAN]	 [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
21M4UZOC04	GENETICS	DSC THEORY - IV	IV	5	5	0	0	4
Objective	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, Mutton - 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
Course Outcome	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								
Text Books	1. Verma, P.S. and Agarwal,V.K. (1995) Genectis, 8th edition, S. Chand & Co, New Delhi							

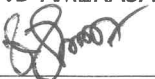

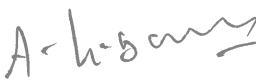
Reference Books	1.Surendra Jain, Text Book of Genetics,1st Edition, Wave Publication. 2. Gunther S. Stent (1986) Molecular Genetics. Macmillan Publishing Co Inc. 3. Higgins, I.I, Best, G.J and Jones, J (1996) Biotechnology - Principles and application Blackwell scientific Publication Oxford London.
Website Link	1. https://bit.ly/3RwSAm3 2. https://bit.ly/3ejFMkG 3. https://bit.ly/3q6xYp0
L-Lecture T-Tutorial P-Practical C-Credit	

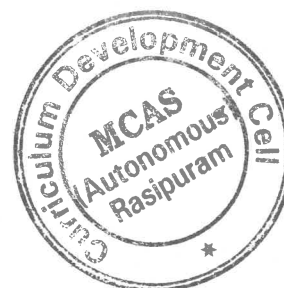
B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UZOC04	GENETICS	DSC THEORY - IV	IV	5	5	0	0	4

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	M	S	S	S	M	S
CO3	S	M	M	L	M	S	S	S	S	L
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						

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

Designed By	Verified By	Approved By
Dr.D AMERASAN 	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
21M4UZOP02	PRACTICAL : CELL AND MOLECULAR BIOLOGY & GENETICS	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	Sessions	
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								
Text Books	1.Celis JE (ed) (1998) Cell Biology: A Laboratory Handbook, 2nd edn. San Diego: Academic Press.							
Reference Books	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,							
Website Link	1. https://bit.ly/3RgJrhV 2. https://bit.ly/3ASVBWW 3. https://bit.ly/3qdnwMA							

L-Lecture

T-Tutorial

P-Practical

C-Credit

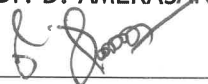
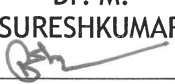
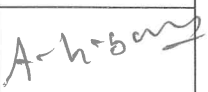
B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UZOP0 2	PRACTICAL : CELL AND MOLECULAR BIOLOGY & GENETICS	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. M. SURESHKUMAR 	



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
Objective	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	
Course Outcome	After completion of the course, students should be able to							
	CO1: Understand the importance of the dairy farming and milk production					K1		
	CO2: Know the dairy breeds and its products					K2		
	CO3: Interpret the nutritive value of cattle feed					K3		
	CO4: Categorize the milk products and its nutritive values					K3		
	CO5: Develop the self employability skills					K3		
Learning Resources								
Text Books	1. Y. H. Hui 1996, Dairy Science and Technology Handbook: Volume I, II, & III, Wiley publisher							
Reference Books	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 Khameer, Milk Production and processing. Daya publishing House, Delhi, 2014							
Website Link	1. https://bit.ly/3KMUDA9 2. https://bit.ly/3KKpoWB 3. https://bit.ly/3BfyDuQ							

L-Lecture

T-Tutorial

P-Practical


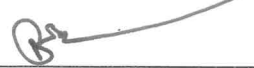
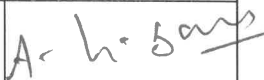
C-Credit

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						

Tutorial Schedule	1. Interactive sessions 2. Quiz
Teaching and Learning Methods	1. Lectures 2. Discussions 3. 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 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
21M4UZON03	ANIMAL BEHAVIOR	NMEC -II	IV	2	2	0	0	2
Objective	To Understand the knowledge on animal behaviors like as communication and mimic for their protection							
Unit	Course Content						Knowledge Levels	Sessions
I	Introduction to ethology & its types- History of Animal Behavior and Tinbergen's experiment						K1-K3	4
II	Animal Communication -Visual, Auditory and chemical communication.						K1-K2	4
III	Social behavior and Social training of animals-Reproductive behavior of mammals						K3	4
IV	Migration of birds & parental care of fishes & amphibian						K2- K3	4
V	Social life of insects & its characteristics						K2- K3	4
Course Outcome	After completion of the course, students should be able to							
	CO1: Understand the behaviour pattern of the animals						K1	
	CO2:Compare the different types of animal communication						K2	
	CO3: Illustrate the Importance of social behaviours in the animals						K2	
	CO4: Analyze and understand the parental care of animals						K3	
	CO5: Interpret the skills to understand the animal behaviours and involve in the domain of animal husbandry						K3	
Learning Resources								
Text Books	1.Aubrey Manning (2012) Introduction to Animal Behavior, Sixth Edition, Cambridge Publication. 2. Reena Mathur (2014) Animal Behaviour, Fourth Edition, Rastogi Publication.							
Reference Books	1.Dugatkin, L.A. (2013) Principles of Animal Behavior. 3rd Edition.WW Norton and Co. 2.Dukas.R & Ratcliffe,J.M(2009) Cognitive ecology II. University of Chicago Press. 3.Kappeler, P.M (2010) Animal Behaviour: Evolution and Mechanisms (electronic resource). Berlin, Heidelberg : Springer-Verlag Berlin Heidelberg.							
Website Link	1. https://bit.ly/3cQo6gg . 2. https://bit.ly/3KOD6rf							

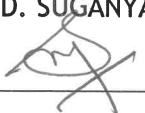
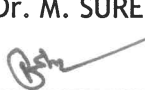
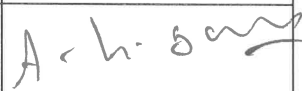
L-Lecture T- Tutorial P- Practical C- Credit

B.Sc-Zoology Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
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							

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

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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
21M4UZON04	WILDLIFE CONSERVATION	NMEC -IV	IV	2	2			2
Objective	To learn about protection and nurture the natural habitats of wild animals and understand the wildlife legislation							
Unit	Course Content						Knowledge Levels	Sessions
I	Scope and importance of Wildlife of India Definition of Wildlife: Causes of wildlife depletion; Economic importance of wildlife; need for wildlife conservation; rare, endangered, threatened and endemic species in India.						K1	4
II	Forestry & Silviculture Forest types in India- identification, dendrology; Deforestation & Impacts; Forest Inventory; Natural and artificial regeneration of forests; nursery techniques-seed technology- Collection, storage, pre- treatment and germination, establishment and tendings; Silvicultural systems: Factors influencing vegetation - Regeneration of forests - Methods of propagation - grafting -Nursery & Planting techniques - Clear felling, coppice and conversion systems - Silviculture management in India.						K1-K2	4
III	Human wildlife conflicts Basic concepts, reasons for conflicts, Identification of damages caused by wild animals and control measures; Case studies - Elephant, gaur, wild boar, monkey, tiger and leopard.						K1-K3	4
IV	Conservation of Wildlife Biodiversity - Classification with examples - in situ & ex situ conservation methods - Sanctuary- National Parks - Tiger reserves (examples) - Zoo's - botanical gardens - germ plasm conservation - DNA libraries - Tissue culture & cloning. Conservation reserves - Sacred Grooves - Corridors - People participation in Conservation.						K1-K3	4
V	Wildlife Legislation National Board for Wildlife -Wildlife laws in India - Highlights of Biological Diversity Act, 2002 & Biological Diversity Rules, 2004-Wildlife trade and regulations; Biodiversity Act 2000; Eco-Development, Eco-Restoration and Ecotourism programmes; Anti-poaching operations - Village Forest Council (VFC).						K3	4
Course	After completion of the course, students should be able to							

Outcome	CO1: Understand the importance of wildlife	K1	
	CO2: Identify the endangered animals in India	K2	
	CO3: Analyze and observe the Human wildlife animals conflicts	K3	
	CO4: Recognize the importance of wildlife conservation	K3	
	CO5: Examine the laws of wildlife protection	K3	
Learning Resources			
Text Books	1. KotpalRL.(2015). Mordern Text Book of Zoology Vertebrates, Rastogi Publications, Meerut. Verma PS. (2010).Chordate Zoology, S Chand Publishers, New Delhi		
Reference Books	1. Goutam Kumar Saha and Subhendu Mazumdar (2017),Wildlife Biology-An Indian Perspective, Eastern Economy Edition 2. Raymond F Dasmann (1996) Wildlife Biology, Second edition, John Wiley and Sons In.		
Website Link	1. https://www.studocu.com/in/document/sam-higginbottom-university-of-agriculture-technology-and-sciences/forestry/silviculture-lecture-notes-3-4/22819867 2. https://prepp.in/news/e-492-wildlife-conservation-efforts-environment-notes		

L-Lecture

T-
TutorialP-
PracticalC-
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
21M4UZON04	WILDLIFE CONSERVATION	NMEC -IV	IV	2	2			2

CO-PO Mapping

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

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