Anekant Education Society's

TULJARAM CHATURCHAND COLLEGE

OF ARTS, SCIENCE & COMMERCE, BARAMATI.

(AUTONOMOUS INSTITUTE)

SYLLABUS

SECOND YEAR B.Sc. ZOOLOGY

ACADEMIC YEAR 2023-2024

SEMESTER - III

Anekant Education Society's

TULJARAM CHATURCHAND COLLEGE OF ARTS, SCIENCE & COMMERCE, BARAMATI.

AUTONOMOUS

Scheme of Course Structure (CBCS)

Faculty of Science

Department of Zoology

SEMESTER- III

Class: S.Y.B.Sc. **Pattern: 40 (IA) + 60 (EA)**

Sr. No.	Code	Paper	Paper Title	Credit	Exam	Marks
1	USZL 231	**Theory**	**Animal Systematics and Diversity - III**	**2**	I / E	**40 + 60**
2	USZL 232	**Theory**	**Applied Zoology- I**	**2**	I / E	**40 + 60**
3	USZL 233	**Practical**	**Zoology Practical-III**	**2**	I / E	**40 + 60**

I A* - Internal Assessment
E A*- External Assessment

SYLLABUS (CBCS) FOR S. Y. B. Sc. ZOOLOGY (w. e. f. June, 2023)

Name of the Program: B.Sc. Zoology **Program Code: USZL**
Class: S.Y. B.Sc. **Semester: III**
Course Name: Animal Systematics and Diversity-III **Course Code: USZL 231**
Number of Credits: 02 **Number of Lectures: 48**

Learning Objectives:-

- Basic classification and characteristics of non-chordates.
- Evolution and development of animals.
- Conservation and sustainable use of biodiversity.
- Animal interactions with their environment.

Learning Outcomes:-

- Conceptual knowledge of animals, their adaptations and associations with environment.
- Taxonomic identification systems in animal classification (Non-chordates) .
- Biodiversity and its conservation.

UNIT	SUB UNITS	SYLLABUS	NO. OF LECTURES
1. Salient features and classification upto classes of the following: (any two examples from each class)			**(12 L)**
	1.1	Arthropoda: - Crustacea, Arachnida, Insecta, Myriapoda and Onychophora.	4
	1.2	Mollusca: - Aplacophora, Gastropoda, Scaphopoda, Pelecypoda, and Cephalopoda	4
	1.3	Echinodermata:- Asteroidea, Ophuroidea, Holothuria, Echinoidea, and Crinoidea	4
2. General topics:			**(22 L)**
	2.1	Insects: Metamorphosis, Mouthparts, Mimicry, Bioluminescence and Economic importance	8
	2.2	Cephalopods: Nervous system and camouflage	6
	2.3	Echinoderms: Autotomy and regeneration, water vascular system and locomotion	8
3. Biology of cockroach			**(14 L)**
	3.1	Systematic position, habit and habitat	1
	3.2	External morphology and sexual dimorphism	1
	3.3	Digestive system	2
	3.4	Circulatory system	2
	3.5	Respiratory system	2
	3.6	Reproductive system	2
	3.6	Nervous system	2
	3.7	Sense organs	1

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1. Kotpal, R. L. (2012). Modern text book of Zoology: Invertebrates. Rastogi Publications.
2. Kotpal, R. L. (1998). Zoology Phylum (Annelida, Mollusca, Arthropoda, Minor Phyla).
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8. Brusca, R. C., & Brusca, G. J. (2002). Invertebrates (No. Ed. 2). Sinauer Associates Incorporated.
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SYLLABUS (CBCS) FOR S. Y. B. Sc. ZOOLOGY (w. e. f. June, 2023)

Name of the Program: B.Sc. Zoology **Program Code: USZL**
Class: S.Y. B.Sc. **Semester: III**
Course Name: Applied Zoology-I **Course Code: USZL 232**
Number of Credits: 02 **Number of Lectures: 48**

Learning Objectives:-

- Information on economic aspects of zoology like fishery, dairy science, pearl culture
- Knowledge of various aspects of dairy industry.
- Skill of pearl culture and budget allocation for it.
- Knowledge about different indigenous and exotic cattle breeds and buffalo breeds in India.
- Knowledge about different systems of breeding and various aspects dealing with housing of dairy animals.

Learning Outcomes:-

- Explain the concepts of fishery, pearl culture, Agricultural pests & Veterinary science.
- Classify freshwater fishes & can give the economic importance of fishes.
- Distinguish between the common agricultural pests and the damage caused by pests.
- Design the set up for small-scale start up like pearl culture, pest control, cattle breeding, fish farm.

UNIT	SUB UNITS	SYLLABUS	NO. OF LECTURES
1. Fisheries:			**(08 L)**
	1.1	Introduction to fisheries and aquaculture	1
	1.2	Different types of ponds used in fish farming: Nursery pond, rearing pond and grow out ponds	2
	1.3	Introduction to composite fish farming of Indian major carps (Biology of fish (Rohu, Catla and Mrigal), seed rearing, nutrition and feeding habits)	3
	1.4	**Fish transport and preservation:** a) Salting b) Chilling (Use of insulated containers, etc.) c) Freezing d) Canning	2
2. Freshwater Pearl Culture:			**(18 L)**
	2.1	• Introduction to pearl culture • Global and national status of pearl culture • Significance of pearl culture	2
	2.2	Soil and water management • Soil and water quality standards • Soil and water quality management (Cat clay/pyrite soil, seepage and its control) • Zero water exchange system (water filtration devices, aeration, chlorination, ozonization and radiation) • Organic and inorganic fertilizers	4

	2.3	**Morphology and biology of Lamellidans spp.** • Morphology • Anatomy: Alimentary canal and associated structures	2
	2.4	Formulation and preparation of artificial feeds for larval rearing	2
	2.5	**Implantation techniques in Pearl Culture** • Surgical procedures in pearl culture • Beads insertion • Nucleus implantation • Graft tissue preparation	4
	2.6	**Post-operative care and marketing** • Post-operative care. Precautionary measures of pearl culture • Quality improvement • Caring of implanted bivalve • Harvesting of pearl • Sorting of pearl • Marketing and economics concerned with pearl culture	4
3. Integrated Pest Management in Agriculture Crops			**(05 L)**
	3.1	Introduction to insect pests in agriculture crops	2
	3.2	Pest control practices in brief: • Physical control (Define scope) • Mechanical control • Biocide based control • Biological control (Pheromones traps and others)	3
4. Introduction to Dairy Science			**(17 L)**
	4.1	Role of dairy development in rural economy	2
	4.2	**Study of important indian cattle breeds used in dairy:** Deoni, Khillari, Red Kandhari, Malvi, Hariyana, Nagpuri buffalo and Murrha buffalo	4
	4.3	**Exotic breeds:** Jersey and Holstein	1
	4.4	Milk Processing Technology: • Composition of milk and quality parameters • Cleanliness and hygiene of milk production • Filtration and pasteurization • Cooling, chilling, packaging and storage	6
	4.5	Introduction to milk products	4

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1. Shukla, G. S., & Upadhyay, V. B. (2010). Economic zoology. Rastogi Publications.
2. Trivedi, K. K. (1986). Fisheries development.
3. Agarwal, S. C. (1990). Fishery management. APH Publishing.

4. Diana, J. S., Szyper, J. P., Batterson, T. R., Boyd, C. E., & Piedrahita, R. H. (2017). Water quality in ponds. Dynamics of pond aquaculture, 53-71.
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SYLLABUS (CBCS) FOR S. Y. B. Sc. ZOOLOGY (w. e. f. June, 2023)

Name of the Program: B.Sc. Zoology **Program Code: USZL**
Class: S.Y. B.Sc. **Semester: III**
Course Name: Zoology Practical - III **Course Code: USZL 233**
Number of Credits: 02 **Number of Practicals: 10**

Learning Objectives:-

- Identification of invertebrate animals and fishes of economic importance.
- Culturing of invertebrate animals and fishes of economic importance.
- Dissection and study of various systems of invertebrate animals.
- Analysis of milk quality parameters.

Learning Outcomes:-

- Acquires the skills to classify various invertebrate taxa.
- Cultures invertebrate animals in laboratory.
- Explains process of dissection, performs it and distinguishes various systems and organs of invertebrate animal.
- Recognizes the damage of the agricultural crops and its causes.
- Distinguishes between normal and adulterated milk.

Sr. No.	Title of the Practical	E/D
1	Classification of following taxa to their 'class level' with reason: Phylum Arthropoda (Butterfly and Scorpion) Phylum Mollusca (*Pila* and Octopus) Phylum Echinodermata (Sea star and Feather star)	(D)
2	Culturing of cockroach (Activity based)	
3	Study of morphology, sexual dimorphism and digestive system of cockroach	(E)
4	Study of nervous system of cockroach	(E)
5	Study of reproductive system of cockroach	(E)
6.	Temporary / Permanent mountings of a) Cornea b) Thoracic spiracles c) Gizzard	(E)
7.	Taxonomic identification, feeding habit and economic importance of following fish: a) Rohu b) Catla c) Mrigal	(D)
8.	Study of insect pests with respect to marks of identification, nature of damage and control measures a) Jowar stem borer b) Lemon butterfly	(D)
9.	Extraction of casein from milk and its confirmatory test	(E)
10.	Measurement of density of milk using different samples by Lactometer	(E)
11.	Estimation of primary productivity in aquatic ecosystem by using Light and dark bottle method	(E)

12	Submission of short project report on Economics of Aquaculture / Pearl culture / Dairy / Assessment of economic impact of various pests on crop (Activity based practical)	(D)
13.	Compulsory visit to Biodiversity park / Dairy farm /Aquaculture farm. (Submission of detailed visit report is compulsory).	(E)
***D- Demonstration; E- Experiment.**		