

<b>DEPARTMENT OF ZOOLOGY</b>				<b>CLASS: I B.Sc. Chemistry</b>				
<b>Semester</b>	<b>Course Type</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>	<b>Contact Hours/week</b>	<b>CIA</b>	<b>Ext</b>	<b>Total</b>
II	Allied	20U2ZAC2	Applied Zoology	4	4	25	75	100

**Course Objectives:**

1. To understand the economic importance of animals.
2. To create awareness among the students about the applied aspects of Zoology.
3. To gain knowledge on various techniques employed in different culture systems.
4. To apply efficiently and execute the methodology for field practice.
5. To motivate the students for the self employment.

**Unit-I: Apiculture & Lac culture**

Introduction to Apiculture, Types of honey bees, Bee colony, Newton's bee hive, management of an apiary, uses of honey, Bee wax and Bee venom. Lacculture: Life history and rearing of lac insects and uses of lac.

**Unit-II: Sericulture**

Types of silkworm, Life cycle of silkworm, Rearing of silkworm, Silk glands, diseases of silkworm (Pebrine, muscardine and flacherie), Role of Central Silk Board.

**Unit-III: Poultry & Dairy farming**

Poultry: Breeds of poultry, Types of poultry house and Principles for construction of poultry house, Nutrition, Diseases and control. Dairyfarming: Economically important cattle, Nutritive value of milk, Livestock diseases: Mastitis, Foot and mouth diseases and Rinder pest.

**Unit-IV: Pisciculture & Vermiculture**

Pisciculture: Types of culturable fishes (fin fishes and shell fishes), Polyculture of carps. Vermiculture: Species, methods of culture, vermiwash, uses of vermicompost.

**Unit-V: Edible & Pearl Oyster farming**

Edible Oysterfarming: Biology, spat collection, culture methods, harvesting, cleaning and preservation. Pearl Oysterfarming: pearl formation and culture of pearls. Seaweed culture: culture methods and uses of seaweeds.

**Books for Study**

1. Tomer B.S, 2011. *Economic Zoology*, Emkay publications, Delhi.
2. Arumugam N, Murugan S, Johnson Rajeshwar J and Ramprabha R, 2005. *Applied Zoology*, Saras publication, Nagercoil.
3. Johnson M and Kesary M, 2008. *Sericulture* IV<sup>th</sup> Edition, N.M.C. College, Marthandam.
4. Ganga G and Sulochanachetty J, 2000. *An Introduction to Sericulture*, Oxford & IBH Publishing Company Pvt. Ltd. New Delhi.
5. Arumugam N, 2000. *Aquaculture*, Saras publication, Nagercoil.
6. Mery Violet Chrity A, 2014. *Vermitechnology*, MJP Publishers, New Delhi.

### **Books for References**

1. Ravindranathan K.R, 2005. *A text book of economic zoology*, Dominant publishers and distributors, New Delhi.
2. Vasantharaj David B and Kumaraswamy T, 1996. *Elements of Economic Entomology*, Popular book depot, Chennai.
3. Venkatanarasaiah P, 2013. *Sericulture*, APH Publishing Corporation, New Delhi.

### **Resources**

1. [http://agritech.tnau.ac.in/farm\\_enterprises/fe\\_apiculture\\_home.html](http://agritech.tnau.ac.in/farm_enterprises/fe_apiculture_home.html)
2. [http://agritech.tnau.ac.in/sericulture/seri\\_index.html](http://agritech.tnau.ac.in/sericulture/seri_index.html)
3. [http://www.agritech.tnau.ac.in/expert\\_system/poultry/index.html](http://www.agritech.tnau.ac.in/expert_system/poultry/index.html)
4. [http://agritech.tnau.ac.in/animal\\_husbandry/animhus\\_cattle%20\\_index\\_page.html](http://agritech.tnau.ac.in/animal_husbandry/animhus_cattle%20_index_page.html)
5. [http://agritech.tnau.ac.in/fishery/fish\\_index.html](http://agritech.tnau.ac.in/fishery/fish_index.html)
6. [http://agritech.tnau.ac.in/org\\_farm/orgfarm\\_vermicompost.html](http://agritech.tnau.ac.in/org_farm/orgfarm_vermicompost.html)

### **Pedagogy**

Chalk and Talk, PPT, group discussion, seminar, interaction, quiz, tutorial and virtual labs.

**Course Learning Outcomes:**

	<b>CLO Statement</b>	<b>Knowledge level</b>
CLO-1	Relate the economic importance of Zoology in human welfare.	K1
CLO-2	Understand the insect and animal types, rearing techniques and it uses.	K2
CLO-3	Apply the knowledge to execute the methodology for field practice.	K3
CLO-4	Analyse the problem in culture practices and to rectify the same.	K4
CLO-5	Infer the biological importance of Apiculture, Lac culture, Sericulture, Poultry farming, Dairy farming, Pisciculture, Vermiculture, Edible oyster and Perl oyster culture.	K4

**Mapping with Programme Specific Outcomes of Chemistry:**

	<b>PSO-1</b>	<b>PSO-2</b>	<b>PSO-3</b>	<b>PSO-4</b>	<b>PSO-5</b>	<b>PSO-6</b>	<b>PSO-7</b>	<b>PSO-8</b>
CLO-1	2		1			2		
CLO-2	2		1			2		
CLO-3	2		2			2	2	
CLO-4	2	1	2	1		2		
CLO-5	2					1		

3- Advance application; 2- Intermediate level; 1- Basic level

**Mapping with Programme Outcomes:**

	<b>PO-1</b>	<b>PO-2</b>	<b>PO-3</b>	<b>PO-4</b>	<b>PO-5</b>
CLO-1	2	2	2	3	3
CLO-2	1	2	2	3	2
CLO-3	2	2	2	3	3
CLO-4	2	3	2	3	3
CLO-5	2	3	2	3	3

3- Advance application; 2- Intermediate level; 1- Basic level

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### Articulation Mapping - K Levels with Course Learning Outcomes (CLOs)

Sl. No	CLOs	K- Level	Section A		Section B		Section C (Either/or Choice)	Section D (Open Choice)
			MCQs		Short Answers			
			No. of Questions	K- Level	No. of Questions	K- Level		
1	CLO 1	Up to K 2	2	K1 & K2	1	K1	2 (K1&K1)	1(K2)
2	CLO 2	Up to K 3	2	K1 & K2	1	K2	2 (K2&K2)	1(K3)
3	CLO 3	Up to K 3	2	K1 & K2	1	K2	2 (K3&K3)	1(K3)
4	CLO 4	Up to K 4	2	K1 & K2	1	K2	2 (K4&K4)	1(K4)
5	CLO 5	Up to K 4	2	K1 & K2	1	K2	2 (K4&K4)	1(K3)
No. of Questions to be asked			10		5		10	5
No. of Questions to be answered			10		5		5	3
Marks for each question			1		2		5	10
Total Marks for each section			10		10		25	30

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

### Distribution of Section-wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (No Choice)	Section C (Either/or)	Section D (Open Choice)	Total Marks	% of Marks without choice	Consolidated
K1	5	2	10	--	<b>17</b>	14.17	<b>42%</b>
K2	5	8	10	10	<b>33</b>	27.5	
K3	-	-	10	30	<b>40</b>	33.33	<b>33%</b>
K4	-	-	20	10	<b>30</b>	25	<b>25%</b>
Total Marks	10	10	50	50	<b>120</b>	100.00	<b>100%</b>

**LESSON PLAN (Total hours: 60)**

Unit	Description	Staff Name	Hours	Mode
I	Introduction to Apiculture		1	Group Discussion
	Types of honey bees		1	PPT
	Bee colony		1	Interaction
	Newton's bee hive		1	Group Discussion
	Management of an apiary		2	Interaction
	Uses of honey		1	Chalk and Talk
	Bee wax & Bee venom		2	Lecture
	Life history of lac insects		1	Group Discussion
	Rearing of lac insects		1	Lecture
	Uses of lac		1	Interaction
II	Types of silkworm		2	Group Discussion
	Life cycle of silkworm		2	Interaction
	Rearing of silkworm		2	Chalk and Talk
	Silk glands		1	Lecture
	Disease of silkworm (Pebrine)		1	Chalk and Talk
	Disease of silkworm (Muscardine)		1	Chalk and Talk
	Disease of silkworm (Flacherie)		1	Chalk and Talk
	Role of Central Silk Board		2	Interaction
III	Breeds of poultry		2	Group Discussion
	Types of poultry house		1	Interaction
	Principles for construction of poultry house		2	Chalk and Talk
	Nutrition		1	Interaction
	Poultry diseases and control		2	Lecture
	Economically important cattle		2	PPT
	Nutritive value of milk		1	Interaction
	Livestock diseases: Mastitis, Foot and mouth diseases and Rinder pest		1	Chalk and Talk
IV	Types of culturable fishes (fin fishes)		2	Group Discussion
	Types of culturable fishes (shell fishes)		2	Interaction
	Polyculture of carps		2	Chalk and Talk
	Vermiculture: Species		2	PPT
	Methods of vermiculture		2	Interaction
	Vermiwash		1	Lecture
	Uses of vermicompost		1	Interaction
V	Biology of Edible Oyster		2	Group Discussion
	Edible Oyster farming: Spat collection		1	Interaction
	Edible Oyster farming: culture methods, harvesting, cleaning and preservation		2	Chalk and Talk
	Pearl Oyster farming: pearl formation		2	Chalk and Talk
	Culture of pearls		2	PPT
	Seaweed culture: culture methods		2	Lecture
	Uses of seaweeds		1	Interaction

**Course designers: Dr. L.D. Devasree and Mrs. P. Sumathi**