SEMESTER V- MAJOR ELECTIVE I A

UEZOA20- ECONOMIC ZOOLOGY

Year	SEM	Course code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
III	**V**	**UEZOA20**	**Economic Zoology**	**Theory**	**Core Elective**	**5**	**5**	**100**

Objectives:

- To learn the economic importance of animals
- To motivate the students to become entrepreneurs

Course Outcomes:

On completion of the course the student will be able to…

CO1: Demonstrate culture techniques of apiculture, sericulture, lac culture and vermiculture.
CO2: Illustrate the preparation and management of fish culture ponds.
CO3: Differentiate breeds of fowl and describe poultry and piggery management.
CO4: Discuss Dairy farming and tanning process.
CO5: Explain processing of wool, fur and obtains insight of pharmaceutical products from animals.

CO/PSO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	H	H	H	M	M	H
CO2	H	H	H	M	M	H
CO3	H	H	H	M	M	H
CO4	H	H	H	M	M	H
CO5	H	H	H	M	M	H

CO/PO	PO					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	H	H	H	H	H	H
CO2	H	H	H	H	H	H
CO3	H	H	H	H	H	H
CO4	H	H	H	H	H	H
CO5	H	H	H	H	H	H

Unit 1: **(15 Hours)**

1.1: Introduction- Culture methods- equipments – Apiculture. (K1, K2, K3)
1.2: Apiculture- Products- disease and control measures. (K1, K2, K3)
1.3: Culture methods- equipments Sericulture. (K1, K2, K3)
1.4: Products- disease and control measures in Sericulture. (K1, K2, K3)
1.5: Culture methods- equipments Vermiculture. (K1, K2, K3)
1.6: Culture methods- equipments Lac culture. (K1, K2, K3)

Unit 2:(15 Hours)

2.1: Aquaculture-fresh water fishery-farm management. Seed collection-culture techniques.(K1,K2,K3)
2.2: Edible fishes. Equipments, nets and traps. (K1, K2, K3)
2.3: Marine fish culture. (K1, K2, K3)
2.4: Prawn culture. (K1, K2, K3)

2.5: Pearl culture. (K1, K2, K3)
2.6: By products of fishing industry- Diseases of Fish and prawn. (K1, K2, K3)

Unit 3: (15 Hours)
3.1: Poultry management – breeds of fowls - selection of breeds. (K1, K2, K3)
3.2: Fowl house – types of rearing – feeds. (K1, K2, K3)
3.3: Poultry products. (K1, K2, K3)
3.4: Preservation of eggs-by products of egg. (K1, K2, K3, K4)
3.5: Disease of fowls and control. (K1, K2, K3)
3.6: Piggery industry and byproducts. (K1, K2, K3)

Unit 4: **(15 Hours)**
4.1: Dairy farming - breeds of milch animals. (K1, K2, K3)
4.2: Housing. (K1, K2, K3)
4.3: Feeds. (K1, K2, K3)
4.4: Disease and control. (K1, K2, K3)
4.5: Leather industry -processing of leather. (K1, K2, K3)
4.6: Tanning - oil and chrome tanning - finishing. (K1, K2, K3)

Unit 5: **(15 Hours)**
5.1: Wool – properties. (K1, K2, K3)
5.2: Wool- processing. (K1, K2, K3)
5.3: Fur industry – fur bearing animals. (K1, K2, K3)
5.4: Processing of fur. (K1, K2, K3)
5.5: Care of fur products. (K1, K2, K3)
5.6: Pharmaceutical products from animals. (K1, K2, K3)

Books for Study and Reference:

Textbooks:
1. Ahsan J., and Sinha SP- Handbook of Economic zoology, S. Chand and Co., New Delhi, 2009.
2. Shukla GS, and Upadhyay SP- Economic Zoology, Ratogi Publication, Meerut, 1994.

Reference Books:
3. Mary Violet Christy A-Vermitechnology, MJP Publication Chennai,1976.
4. Ayyar TVT- Handbook of Economic Entomology for South India, Govt press, Madras, 1963.
5. Jhinghran VG- Fish and fisheries of India, Hindustan Publishing Corp., New Delhi, 1982.
6. Jawaid Ahgan, Subhas Prasad Sinha- A Hand book on Economic Zoology, S. Chand & Co. Ltd., New Delhi, 2000.

E-Resources:
http://csb.gov.in
http://www.fao.org
http://nfdb.gov.in

SMESTER V - MAJOR ELECTIVE IB

UEZOB20 –VERMICULTURE

Year	SEM	Course code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
III	V	UEZOB20	Vermiculture	Theory	Core Elective	5	5	100

Objectives:

- To learn the production and importance of organic fertilizers.
- To motivate students for self-employment.

Course Outcomes (CO):

On completion of the course the student will be able to…

CO1: Identify various groups of earthworms and impact of earthworm on soil.
CO2: Describe large and small scale composting methods.
CO3: Explain the factors affecting vermicomposting and preparation of vermibed.
CO4: Discuss the use of vermicompost and vermiwash in agriculture and horticulture.
CO5: Elaborate the role of earthworm in agriculture, fishing, medicine and pollution and promotion of vermiculture.

CO/PO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	H	H	H	M	H	H
CO2	H	H	H	M	H	H
CO3	H	H	H	M	H	H
CO4	H	H	H	M	H	H
CO5	H	H	H	M	H	H

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

Unit 1: **(15 Hours)**

1.1: Introduction and scope of Vermiculture. (K1, K2, K3)
1.2: Ecological groups of earthworms – Epigeic, Endogeic, Anegic. (K1, K2, K3)
1.3: Varieties of Earthworm – Night crawlers – Field crawlers.(K1, K2, K3)
1.4: Manure worms – Red worms. (K1, K2, K3)
1.5: Physical and chemical effects of earthworm on soil.(K1, K2, K3)
1.6: Biological effects of earthworm on soil.(K1, K2, K3)

Unit 2: **(15 Hours)**

2.1: Organic waste sources.(K1, K2, K3)
2.2: Vermi composting definition and methods.(K1, K2, K3)
2.3: Small scale Pit method.(K1, K2, K3)

2.4: Large scale pit method.(K1, K2, K3)
2.5: Four tanks method.(K1, K2, K3)
2.6: Two tank method. (K1, K2, K3)

Unit 3: **(15 Hours)**

3.1: Factors affecting vermicomposting: pH.(K1, K2, K3)
3.2:Factors affecting vermicomposting Moisture, Temperature.(K1, K2, K3)
3.3: Factors affecting vermicomposting Light, location operation site.(K1, K2, K3)
3.4: Preparation of vermibed.(K1, K2, K3)
3.5: Collection of compost.(K1, K2, K3)
3.6: Separation of earthworm.(K1, K2, K3)

Unit 4: **(15 Hours)**

4.1: Application of vermicomposting in agriculture.(K1, K2, K3)
4.2: Application of vermicomposting horticulture practices.(K1, K2, K3)
4.3: Economics of Vermiculture.(K1, K2, K3)
4.4: Vermi wash.(K1, K2, K3)
4.5: Preparation of Vermiwash.(K1, K2, K3)
4.6: Uses of Vermi wash.(K1, K2, K3)

Unit 5: **(15 Hours)**

5.1: Role of earthworm in agriculture.(K1, K2, K3)
5.2: Role of earthworm in fishing. (K1, K2, K3)
5.3: Role of earthworm in medicine.(K1, K2, K3)
5.4: Role of earthworm in pollution control.(K1, K2, K3)
5.5: Schemes and projects available for the promotion of Vermiculture.(K1, K2, K3)
5.6: Loans to start vermicomposting.(K1, K2, K3)

Books for Study and Reference:

Textbooks:

1. Edwards, C.A., and Bother, B.- Biology of Earthworms – Chapman Hall Publishers and Co., London, 1996.
2. Ismail, S.A.- Vermitechnology – The Biology of Earthworms- Orient Longman Publishers – India, 1997.

Reference Books:

3. Ranganathan, L.S- Vermibiotechnology from soil health to human health – Agrobios – India. 2006
4. Talashikar, S.C- Earthworms in Agriculture – Agrobios – India, 2008.
5. Gupta, P.K.- Vermicomposting for sustainable Agriculture (2nd Edition) – Agrobios – India, 2008.

E-Resources:

https://communitycrops.org
https://composting.ces.ncsu.edu
https://www.in.gov

SKILL BASED ELECTIVE

USZOD420-POULTRY KEEPING

Year	SEM	Course code	Title of the Course	Course Type	Course Category	H/ W	Credits	Marks
II	IV	USZOD420	Poultry Keeping	Theory	Skill based Elective	2	2	100

Objectives:

- To learn the types of breeds and housing methods for successful poultry keeping.
- To guide and motivate self-employment.

Course Outcomes:

On completion of the course the student will be able to…

CO1: Acquire Knowledge on different types of breeds of Fowls

CO2: Describe the essentials and maintenance of a good house

CO3: Compare the different types of rearing methods

CO4: Discuss the feeding requirements and its management

CO5: Explain the nutritive value and products of poultry. Identify Poultry diseases and vaccination Schedule.

CO/PSO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	H	H	H	H	H	H
CO2	H	H	H	H	H	H
CO3	H	H	M	H	H	H
CO4	H	H	H	H	H	H
CO5	H	H	H	H	M	H

CO/PO	PO					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	H	H	H	H	H	H
CO2	H	H	H	H	H	H
CO3	H	H	H	H	H	H
CO4	H	H	H	H	H	H
CO5	H	H	H	H	H	H

Unit 1: (6 Hours)

1.1: Introduction to Poultry Keeping- Importance. (K1, K2, K3)

1.2: Breeds of fowls- Desi Breeds. (K1, K2, K3)

1.3: Exotic Breeds- American Class. (K1, K2, K3)

1.4: Asiatic Class. (K1, K2, K3)

1.5: English Class. (K1, K2, K3)

1.6: Mediterranean Class. (K1, K2, K3)

Unit 2: (6 Hours)

2.1: Essentials of a good house. (K1, K2, K3)

2.2: Maintenance-Summer and Winter. (K1, K2, K3)

2.3: Management of Free –Range System, Semi-Intensive System. (K1, K2, K3, K4)

2.4: Intensive System- Deep Litter System. (K1, K2, K3, K4)

2.5: Battery System, Folding Unit System. (K1, K2, K3, K4)

2.6: Equipments- Types of Feeder and Water troughs. (K1, K2, K3)

Unit 3: (6 Hours)

3.1: Reproduction in Fowl- Male and Female Reproductive system. (K1, K2, K3)
3.2: How is egg formed? Types of Abnormal Eggs, Grading of Egg. (K1, K2, K3)
3.3: Breeding in Fowls- Cross Breeding- Selection of Best Layer. (K1, K2, K3)
3.4: Selection of Eggs, Fertility and quality of eggs. (K1, K2, K3)
3.5: Hatchery Equipment- Incubator, Egg tray, Tray Cart and Racks, Egg Candler, Chick boxes. (K1, K2, K3)
3.6: Natural and Artificial methods of Incubation and Hatching. (K1, K2, K3)

Unit 4: (6 Hours)

4.1: Poultry Feeding –Food Ration. (K1, K2, K3)
4.2: Poultry feed ingredient – Energy rich feed stuffs, Protein-rich feed stuffs, Mineral and Vitamin Sources, Feed additives. (K1, K2, K3)
4.3: Nutrient requirement of Poultry, Feed formulation for different age groups.(K1, K2, K3, K4)
4.4: Feeding systems of Poultry, Feeding Management. (K1, K2, K3, K4)
4.5: Nutritive value of Egg, Preservation of Egg, Products of Egg- Albumen flakes, Frozen Yolk, Egg Powder. (K1, K2, K3, K4)
4.6: By products of Poultry, Processing of Meat. (K1, K2, K3)

Unit 5: (6 hrs)

5.1: Care and Management of Poultry- Layer, Grower, Broiler, Pullet. (K1, K2, K3)
5.2: Symptoms, Transmission, Treatment and Control of Ranikhet, Fowl Pox, Coryza, Coccidiosis, Polyneuritis. (K1, K2, K3, K4)
5.3: Egg Drop Syndrome, Avian Influenza, Fowl Cholera. (K1, K2, K3)
5.4: Chronic Respiratory Disease. (K1, K2, K3)
5.5: Endoparasitic and Ectoparasitic diseases. (K1, K2, K3)
5.5: Vaccination Schedule. (K1, K2, K3)

Book for study and Reference:

Textbooks:

1) Jayasurya, Arumugam N. – Economic Zoology- Saras Publication, Nagercoil, 2013.
2) Nilotpal Ghosh- Poultry Science and Practice- A Textbook- CBS Publishers and Distributors
Pvt. Ltd. 2015.

Reference Book:

3) Gnanamani M.R. – Modern Aspects of Commercial Poultry Keeping – Ezhil offset printers,
Madurai- 2010
4) Tomar B.S. and Neera Singh- Economic Zoology- Emkay publications, Delhi- 2004.
5) Shukla G.S. and Upadhyay V.B. –Economic Zoology- Rastogi Publications, Meerut- 1997.

E-Resources:

https://thepoultrysite.com
https://www.poultryworld.net
http://www.agritech.tnau.ac.in

SKILL-BASED ELECTIVE

USZOC320– SERICULTURE

Year	SEM	Course code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
II	**III**	**USZOC320**	**Sericulture**	**Theory**	**Skill Based Elective**	**2**	**2**	**100**

Objectives:

- To help the non-science students to understand the life cycle and culture technique of silkworm
- To motivate the students for self-employment

Course Outcomes:

On completion of the course the student will be able to…

CO1: Enlist different variety of silkworms and their economic status

CO2: Explain about mulberry cultivation

CO3: Expand knowledge on utilizing silkworm rearing appliances.

CO4: Elucidate an indulgent of silkworm mounting, silkworm rearing, and silkworm reeling operations.

CO5: Indicate and identify diseases in silkworms and recognize their enemies to take necessary control measures.

CO/PSO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	H	H	H	M	M	H
CO2	H	H	H	M	M	H
CO3	H	H	H	L	M	H
CO4	H	H	H	L	M	H
CO5	H	H	H	M	M	H

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

Unit 1: (6 Hours)

1.1: Scope of sericulture in India and in global market. (K1, K2, K3)

1.2: Economics; Central Silk Board (CSB). (K1, K2, K3)

1.3: Training Facilities in Sericulture. (K1, K2, K3)

1.4: Types of silk worm Mulberry, Tasar, Eri, Muga. (K1, K2, K3)

1.5: Life cycle of *Bombyx mori*. (K1, K2, K3)

1.6: Silk. (K1, K2, K3)

Unit 2:(6 Hours)

2.1: Varieties of Mulberry. (K1, K2, K3)

2.2: Mulberry Cultivation. (K1, K2, K3)

2.3: Propagation, Plantation. (K1, K2, K3)

2.4: Manuring, Pruning. (K1, K2, K3)
2.5: Harvesting, Storing. (K1, K2, K3)
2.6: Transporting. (K1, K2, K3)

Unit 3: (6 Hours)
3.1: Silkworm Rearing-Rearing House. (K1, K2, K3, K4)
3.2: Appliances used for Rearing, Feeding. (K1, K2, K3, K4)
3.3: Cleaning and Spinning. (K1, K2, K3)
3.4: Factors for rearing. (K1, K2, K3, K4)
3.5: Temperature. (K1, K2, K3)
3.6: Humidity. (K1, K2, K3)

Unit 4: (6 Hours)
4.1: Rearing operations – Disinfection. (K1, K2, K3)
4.2: Brushing, Feeding. (K1, K2, K3)
4.3: Bed Cleaning, Spacing. (K1, K2, K3)
4.4: Care during Moulting, Mounting. (K1, K2, K3)
4.5: Harvesting of cocoons. (K1, K2, K3)
4.6: Storing. (K1, K2, K3)

Unit 5:(6 Hours)
5.1: Silkworm Diseases and Control- Pebrine. (K1, K2, K3, K4)
5.2: Flacherie. (K1, K2, K3, K4)
5.3: Muscardine, Grasserie. (K1, K2, K3, K4).
5.4: Natural Enemies. (K1, K2, K3)
5.5: Cocoon Marketing. (K1, K2, K3)
5.6: Loans to start sericulture. (K1, K2, K3)

Books for Study and Reference:
Textbooks:
1. Sukla G.S. and Upadhyay V.B. – Economic Zoology – ISBN Rastogi Publications, Meerut, India, 1992.
2. Ganga G. and Sulochana Chetty J. An Introduction to Sericulture Oxford Publication, New Delhi, India, 1997.

Reference Books:
3. Ganga G. Comprehensive Sericulture Vol. II: Silkworm Rearing and Silk Reeling – ISBN Oxford Publication, New Delhi, India, 2003.
4. Ganga G. Comprehensive sericulture Vol. I: Moriculture – Oxford Publication, New Delhi, India, 2003.

E-resources:
http://csb.gov.in
http://www.csrtimys.res.in
https://tnsericulture.gov.in