Open Elective Course Outcomes and Course Content

Under New Education Policy – Year 2021-22 for

I Semester

Core Course Content

Course Title: **Zoology for Entrepreneurs**	Course Credits: **3**
Course Code: **ZOOE1**	L-T-P per week: 3-0-0
Total Contact Hours**: 42 hours**	Duration of ESA: 2 hours
Formative Assessment Marks: **40**	Summative Assessment Marks:**60**

Course Outcomes (COs):

At the end of the course the student will be able to:

- Gain knowledge about silkworms rearing and their products.
- Gain knowledge in Bee keeping equipment and apiary management.
- Acquaint knowledge on dairy animal management, the breeds and diseases of cattle and learn the testing of egg and milk quality.
- Acquaint knowledge about the culture techniques of fish and poultry.
- Acquaint the knowledge about basic procedure and methodology of vermiculture.
- Learn various concepts of lac cultivation.
- Students can start their own business i.e. self-employments.
- Get employment in different applied sectors

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	**CC 1**	**CC 2**	**CC 3**	**CC 4**	**CC 5**	**CC 6**	**CC 7**	**CC 8**	**CC 9**	**CC 10**	**CC 11**	**CC 12**
I Core competency	X											
II Critical thinking	X											
III Analytical reasoning	X											
IV Research skills	X											
V Team work	X											

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark _X‘ in the intersection cell if a course outcome addresses a particular program outcome.

Content	Hrs
Unit I	**14**
Chapter 1. Sericulture: • History and present status of sericulture in India • Mulberry and non-mulberry species in Karnataka and India • Mulberry cultivation • Morphology and life cycle of *Bombyx mori* • Silkworm rearing techniques: Processing of cocoon, reeling • Silkworm diseases and pest control **Chapter 2. Apiculture:** • Introduction and present status of apiculture • Species of honey bees in India, life cycle of *Apis indica* • Colony organization, division of labour and communication • Bee keeping as an agro based industry; methods and equipments: indigenous methods, extraction appliances, extraction of honey from the comb and processing • Bee pasturage, honey and bees wax and their uses • Pests and diseases of bees and their management	
Unit II	**14**
Chapter 3. Live Stock Management: • **Dairy:** Introduction to common dairy animals and techniques of dairy management • Types, loose housing system and conventional barn system; advantages and limitations of dairy farming • Establishment of dairy farm and choosing suitable dairy animals-cattle • Cattle feeds, milk and milk products • Cattle diseases • **Poultry:** Types of breeds and their rearing methods • Feed formulations for chicks • Nutritive value of egg and meat • Disease of poultry and control measures **Chapter 4. Vermiculture:** • Scope of vermiculture. • Types of earthworms. • Habit categories - epigeic, endogeic and anecic; indigenous and exoticspecies. • Methodology of vermicomposting: containers for culturing, raw materials required, preparation of bed, environmental pre- requisites, feeding, harvesting and storage of vermicompost. • Advantages of vermicomposting. • Diseases and pests of earthworms.	

Unit – III	14
Chapter 5. Aquaculture: • Aquaculture in India: An overview and present status and scope ofaquaculture. • Types of aquaculture: Pond culture: Construction, maintenance and management; carp culture, shrimp culture, shellfish culture, composite fishculture and pearl culture **Chapter 6. Fish culture:** • Common fishes used for culture. • Fishing crafts and gears. • Ornamental fish culture: Fresh water ornamental fishes-biology breeding techniques • Construction and maintenance of aquarium: Construction of home aquarium, materials used, setting up of freshwater aquaria, aquarium plants,ornamental objects, cleaning the aquarium, maintenance of water quality. Control of snail and algal growth. • Modern techniques of fish seed production **Chapter 7. Prawn culture:** • Culture of fresh and marine water prawns. • Preparation of farm. • Preservation and processing of prawn, export of prawn. **Chapter 8. Lac Culture:** • History of lac and its organization, lac production in India. • Life cycle, host plants and strains of lac insect. • Lac cultivation: Local practice, improved practice, propagation of lacinsect, inoculation period, harvesting of lac. • Lac composition, processing, products, uses and their pests.	

References:

1. Animal Disease- Bairagi K. N. Anmol Publications Pvt.Ltd 2014
2. Applied and Economic Zoology (SWAYAM) web https://swayam.gov.in/nd2_cec20_ge23/preview
3. Bard. J (1986). Handbook of Tropical Aquaculture.
4. Cherian &Ramachandran Bee keeping in-South Indian Govt. Press, Madras.
5. Economics Of Aquaculture - Singh(R.K.P) - Danika Publishing Company 2003
6. Eikichi, H. (1999). Silkworm Breeding (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
7. Ganga, G. (2003). Comprehensive Sericulture Vol-II: Silkworm Rearing and Silk Reeling.
8. Jabde, P.V. (2005) Text Book of Applied Zoology: Vermiculture, Apiculture, Sericulture, Lac culture.
9. JabdePradip V (2005). Textbook of applied Zoology, Discovery Publishing House, New Delhi.
10. Mahadevappa, D., Halliyal, V.G., Shankar, D.G. and Bhandiwad, R., (2000). Mulberry Silk
11. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
12. Reeling Technology Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
13. Roger, M (1990). The ABC and Xyz of Bee Culture: An Encyclopedia of Beekeeping, Kindle Edition.
14. Santhanam, R. A. Manual of Aquaculture.
15. Sathe, T.V. Vermiculture and Organic farming.
16. Shukla and Upadhyaya (2002). Economic Zoology, Rastogi Publishers
17. YadavManju (2003). Economic Zoology, Discovery Publishing House.
18. Zuka. R.1 and Hamiyn (1971). Aquarium fishes and plants

Pedagogy: Written Assignment/Presentation/Project / Term Papers/ Seminar

Formative Assessment	
Assessment Occasion	Weightage in Marks
House Examination/Test – Mid semester test	20
Written Assignment/Presentation/Project /Seminar - I	10
Written Assignment/Presentation/Project /Seminar - II	10
Total	40

End Semester Question Paper Pattern:

Questions	**With choices**	**Total mark**
1 mark	20 x 1	20
2 marks	5 x 2 (7 questions)	10
5 marks	2 x 5 (4 questions)	10
10 marks	2 x 10 (3 questions)	20
TOTAL		**60**