



ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

Course Structure and Syllabus

M.Sc. Zoology (CBCS)

(For Admission Batch 2018-19 onwards)

THIRD SEMESTER



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3rd Semester: Course Structure

Sl. No.	Sub Code	Subject	Hrs / Week			Credit	Marks	
			L	T	P		C	CE
Theory								
1	MZY182301	Parasitology and Toxicology	4	0	0	4	30	70
2	MZY182302	Economic Zoology	3	0	0	3	30	70
3	MZY182303	Animal behaviour	4	0	0	4	30	70
4	MZY182304	Environmental Biology	4	0	0	4	30	70
Practical								
1	MZY182311	Parasitology and Toxicology Lab	0	0	4	2	30	70
2	MZY182312	Economic Zoology & Animal behavior Lab	0	0	4	2	30	70
3	MZY182314	Environmental Biology Lab	0	0	4	2	30	70
Total			15	0	12	21	210	490
Total Contact Hours per Week: 27								
Total Credit : 21								

Detailed Syllabus:

Course Code	Course Title	Hours per week L-T-P	Credit C
MZY182301	Parasitology and Toxicology	4-0-0	4

MODULE 1: Parasitism (12 Lectures)

Symbiosis and Parasitism-Ecological Aspects of Parasitism-Parasite-Host Interaction-Sources of parasitic infections.

Classification of parasites, Protozoa-Amoeba (*Entamoeba histolytica*), sporozoa (*Plasmodium falciparum*), Trematodes (*Fasciola hepatica*), Cestodes (*Taenia saginata*, *Taenia solium*), Nematodes (*Ascaris lumbricoides*).

MODULE 2: Toxicology (10 Lectures)

Toxicology- Basic concepts, Principles and various types of toxicological agents, hazards, risks and their control methods.

MODULE 3: Pollution and radioactive hazards (10 Lectures)

Kinds of environmental pollution (Air, Water, Soil and Sound pollution) and their control methods, Radioactive compounds and their impact on the environment, Vehicular exhaust pollution causes and remedies.

MODULE 4: Health hazards (8 Lectures)

Food poisoning and their control methods.

Public Health Hazards, Heavy metal toxicity (Mercury, Lead), Bioremediation.

MODULE 5: Pesticides (8 Lectures)

Pesticides types, nature and their effects on environment.

Text Books/Reference Books:

1. Parasitology – By Ramnik Sood, C.B.S. Publisher, New Delhi.
2. Parasitology – By K.D. Chaterjee, Medical Pulisher Calcutta.
3. A textbook of Applied Entomology, Vol. II-.K.P. Shrivastava.

Course Code	Course Title	Hours per week L-T-P	Credit C
MZY182302	Economic Zoology	3-0-0	3

MODULE 1: Pest management (8 Lectures)

Methods of pest control, Integrated pest management (IPM).-Biology, Control and damage caused by *Helicoverpa armigera*, *Pyrilla perpusilla*, *Sitophilus oryzae*.

MODULE 2: Aquatic bio-resources (8 Lectures)

Fish Technology: Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed.

Non piscean culture techniques (Prawn and Oysters)

MODULE 3: Vermiculture (5 Lectures)

Vermiculture techniques and vermicomposting for alternative sustainable agriculture.

MODULE 4: Sericulture (5 Lectures)

Types of silk worms (Mulberry & Non mulberry), Techniques of rearing silk worms, Diseases and pests of silk worm.

MODULE 5: Apiculture (5 Lectures)

Different varieties of Honeybee, Methods of bee rearing.

MODULE 6: Poultry Farming (5 Lectures)

Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs.

Text Books/Reference Books:

1. Fish and Fisheries of India: V.G. Jhingran.
2. C.B.L. Shrivastava : Fishes of India
3. S.S. Khanna : An Introduction to fishes
4. R.S. Rath : Fresh water Aquaculture
5. H.D. Kumar: Sustainibility & Management of Aquaculture & Fisheries
6. A.J.K. Mainan : Identification of fishes
7. R. Sanatam : A Manual of fresh water Aquaculture
8. Avian (Poultry Science) Production-2nd revised edition 2018: D Narahari, D Sapkota and JD Mahanta, Publisher: NIPA, New Delhi
9. Concept of Insect Control By MR Ghosh, New Age International Publishers
10. Handbook of Beekeeping and Bee Economics
11. Principles of Insect Pest Management By G.S. Dhaliwal & Ramesh Arora-Kalyani Publishers
12. Agricultural Pest of India and South East Asia by A.S. Atwal-Kalyani Publishers
13. Handbook of Muga Culture Central Silk Board
14. Silk and Sericulture – Published by Directorate of Sericulture, Assam

Course Code	Course Title	Hours per week L-T-P	Credit C
MZY182303	Animal Behaviour	4-0-0	4

MODULE 1: Ethology (10 Lectures)

Introduction - definition, historical out line, patterns of behavior, objectives of behavior, mechanism of behavior.

Learning behavior in animals, types of learning.

MODULE 2: Reflexes (4 Lectures)

Reflexes- reflex action, types of reflexes, reflex arch, characteristics of reflexes.

MODULE 3: Orientation and Communication (4 Lectures)

Different types of orientation and communication in animals (Chemical, visual, touch and auditory).

MODULE 4: Altruism and Sexual selection (8 Lectures)

Altruism – reciprocal altruism, group selection, kin selection and inclusive fitness, cooperation, alarm call.

Sexual selection: intra sexual selection (male rivalry), inter-sexual selection (female choice), infanticide, sperm competition, mate guarding, sexual selection in human (selection preferences), mating system.

MODULE 5: Neural and hormonal control (6 Lectures)

Hormonal control of behaviour. Hormones and pheromones influencing behaviour of animals.

Motivation in animals, physiological basis of motivation.

MODULE 6: Social behavior (8 Lectures)

Social behaviour in insects, social organization in termites and honey bee.

Parental care in amphibians and fishes.

MODULE 7: Ecological aspects of behavior (8 Lectures)

Habitat selection and foraging in animals, defence against predator.

Types and characteristics of biological rhythms, navigation in birds, migration of fishes and birds.

Text Books/ Reference Books:

1. K.K.C Vishwapremi. Animal Behaviour(2011,last edition),Silver Line Publication
2. David McFarland, Animal Behaviour, Pitman Publishing Limited, London, UK.
3. Reena Mathur. Animal Behaviour (2011-12 last edition),Rastogi publication
4. Goodenough et al : Perspectives on Animal Behaviour, Wiley, 1993.
5. Lehner : Hand Book of Ethological Methods.(2nd ed.) Garland, 1996.
6. Manning & Dawkins : An introduction to Animal Behaviour (5th ed.), Cambridge Univ. Press, 1998.
7. Biological Rhythms: Vinod Kumar (2002) Narosa Publishing House, Delhi/ Springer-Verlag, Germany.
8. Slater & Halliday : Behaviour and Evolution,(1st ed.) Cambridge Univ. Press, 1994.
9. Nerve Cells and Animal Behaviour-2nd Edn-Peter J Simmons and David Young,2003.

Course Code	Course Title	Hours per week L-T-P	Credit C
MZY182304	Environmental Biology	4-0-0	4

MODULE 1: Introduction (10 Lectures)

Sources of Environmental hazards, hazard identification and accounting, fate of toxic and persistent substances in the environment, dose response evaluation, exposure assessment.

MODULE 2: Climate Change (8 Lectures)

Greenhouse gases and global warming, Acid rain, Ozone layer destruction, Effect of climate change on public health.

MODULE 3: Waste Management Technologies (8 Lectures)

Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, Biomedical waste handling and disposal, Nuclear waste handling and disposal, Waste from thermal power plants.

MODULE 4: Human Population and the Environment (8 Lectures)

Population growth, variation among nations.
Population explosion – Family Welfare Program, Methods of sterilization.

MODULE 5: Diseases (8 Lectures)

Causes, symptoms and control of Tuberculosis, Asthma, Cholera, Minamata disease, Typhoid.

MODULE 6: Urbanisation (6 Lectures)

Causes of urbanization. Growth of slums, growth of informal sector, pressure on civic amenities; degradation of human resources. Problems of housing, congestion, pollution, loss of agricultural land.

Text Books/Reference Books:

1. Cutter, S.L., Environmental Risk and Hazards, Prentice-Hall of India Pvt. Ltd., New Delhi.
2. Kolluru Rao, Bartell Steven, Pitblado R and Stricoff “Risk Assessment and Management Handbook”, McGraw Hill Inc., New York.
3. Kofi Asante Duah “Risk Assessment in Environmental management”, John Wiley and sons, Singapore.
4. Kasperson, J.X. and Kasperson, R.E. and Kasperson, R.E., Global Environmental Risks, V.N. University Press, New York.
5. Joseph F Louvar and B Diane Louver Health and Environmental Risk Analysis fundamentals with applications, Prentice Hall, New Jersey.

Course Code	Course Title	Hours per week L-T-P	Credit C
MZY182311	Parasitology and Toxicology Lab	0-0-4	2

Sl.No.	Experiments	Hours
1.	Examination of fecal samples for ova.	3
2.	Study of different trematodes and cestodes from permanent slides.	3
3.	Collection, preservation, staining and identification of trematode & cestodes, and preparation of their permanent slides.	3
4.	Collection and examination of molluscan hosts for larvae of trematodes.	3
5.	Study of life stages of <i>Entamoeba histolytica</i> , <i>Giardia intestinalis</i> , <i>Trypanosoma gambiense</i> , <i>Leishmania donovani</i> and <i>Plasmodium vivax</i> through permanent slides/micro photographs.	3
6.	Study of adult and life stages of <i>Fasciolopsis buski</i> , <i>Schistosoma haematobium</i> and <i>Taenia solium</i> through permanent slides/micro photographs.	3
7.	Study of adult and life stages of <i>Ascaris lumbricoides</i> , <i>Ancylostoma duodenale</i> and <i>Wuchereria bancrofti</i> through permanent slides/micro photographs.	3
8.	Study of nematode/cestode parasites from the intestines (Poultry bird or any other sample).	3
	Laboratory note book	
	Viva voce	
	Total	24

Course Code	Course Title	Hours per week L-T-P	Credit C
MZY182312	Economic Zoology & Animal behavior Lab	0-0-4	2

Sl.No.	Experiments	Hours
1.	Study of insect damage to different plant parts/ stored grains through damaged products/ photographs.	4
2.	Maintenance of fresh water aquarium.	4
3.	To study nests and nesting habits of the birds and social insects.	4
4.	Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a short report.	6
5.	To study the phototaxis behaviour in insect larvae.	3
6.	To study the geotaxis behaviour of earthworm	3
	Laboratory note book	
	Viva voce	
	Total	24

Course Code	Course Title	Hours per week L-T-P	Credit C
MZY182314	Environmental Biology Lab	0-0-4	2

Sl.No.	Experiments	Hours
1.	Determination of Physico-Chemical parameters of Water samples (Alkalinity, hardness, turbidity, dissolved oxygen pH, Cl ⁻ , SO ₄ ²⁻ , NO ₃ ⁻). (Any three)	6
2.	Estimation of the size of the population by capture-recapture method (any vertebrate/invertebrate).	6
3.	Visit to a local area to document environmental assets (river/forest/grassland/hill/mountain).	6
4.	Visit to a local polluted site (Urban/Rural/Industrial/Agricultural) to prepare a report.	6
	Laboratory note book	
	Viva voce	
	Total	24
