

SHRI GOVIND GURU UNIVERSITY, GODHRA

B.Sc. ZOOLOGY - SEMESTER-III

MAJOR COURSE - 1 (THEORY)

BS23MJ3ZO1

[Pollution, Vector Borne Diseases, Ecology]

Total Credit - 04

04 Lectures/Week

UNIT	TOPICS	CREDIT	HOURS
Unit-I	<ul style="list-style-type: none">• Various pollutants<ul style="list-style-type: none">a) Air pollutants<ul style="list-style-type: none">i. Gaseous – CO₂, SO₂, NO₂ii. Particulate – Dust, Lead, Aerosolb) Water pollutants: Biological organisms (bacteria protozoa) acids, alkalies, dyes, hydrogen sulphide, pesticides, fertilizers, toxic metals (Fluoride, Hg, and Arsenic), Faeces, domestic waste and suspended mattersc) Soil/ Land pollutants:<ul style="list-style-type: none">i. Industrial solid wastes – Toxic metals i.e., Cu, Pb, Niii. Urban wastes – Garbage, paper, glasses, metal cans, plastics and faeces.iii. Agricultural waste – waste from cattle sheds and poultry farms, fertilizers, pesticides.• Biological treatment of effluents by Trickling filters system	1	15
Unit-II	<ul style="list-style-type: none">• Introduction and types of vectors• Mosquitoes, Flies, Fleas, Ticks, Bugs, Lice, Mites, Cyclops, cockroach as vectors• Study of transmission, symptoms, control and prophylactic measures of following diseases:<ol style="list-style-type: none">1. Mosquito-borne-diseases - Malaria (Anopheles), Dengue (Aedes), Chikungunya (Aedes), Filariasis (Culex)2. Sand fly borne diseases - Visceral Leishmaniasis3. Flea-borne diseases - Plague4. Tick-borne Encephalitis, Crimean-Congo Haemorrhagic Fever (CCHF)5. Bugs/Tsetse flies- Trypanosomiasis• Fleas- River blindness	1	15

Unit-III	<ul style="list-style-type: none"> • Introduction and Branches of Ecology • Biogeochemical cycles: <ol style="list-style-type: none"> 1. Carbon cycle 2. Nitrogen cycle 3. Phosphorous cycle 4. Sulphur cycle • Ecological Succession <ul style="list-style-type: none"> - Kinds of succession - Process of succession - Patterns of succession (Hydrosere, Xerosere) - Significance of ecological succession • Ecotone and Edge Effect • Ecological rules: Bergmann's rule, Allen's rule, Jordan's rule, Cope's rule, Foster's rule, Gloger's rule 	1	15
Unit-IV	<ul style="list-style-type: none"> • Marine Ecosystem: <ul style="list-style-type: none"> - Physico-chemical parameters: Light, Temperature, Pressure, Salinity, Currents and Tides - Zonation in Marine Environment - Types of coral reefs and its ecological importance • Fresh water ecosystem: <ul style="list-style-type: none"> - Characteristics: Salinity, pH, water current, transparency, dissolved gases (oxygen and carbon dioxide), pressure, density, light, temperature and thermal stratification (summer and winter stratification) - Lentic system: Ponds - Characteristics, types, zonation; Lakes - Characteristics and types - Lotic system: Rivers - Characteristics (current, land-water interchange, and oxygen), Zonation (flowing water, rapid/riffle, pool zones) • Terrestrial ecosystems (Biomes): Tundra, Savana, Grassland, Desert and Tropical Rain Forests 	1	15

References:

1. Environmental Pollution (Popular Science), N. Manivasakan, National Book Trust, New Delhi.
2. Ecology and Environment, P. D. Sharma, Rastogi Publications, Meerut.
3. Fundamentals of Ecology, P. S. Odum, Saunders.
4. Concepts of Ecology, N. Arumugam, Saras Publication, Nagercoil.
5. Pedigo L. P. (2002): Entomology and Pest Management. Prentice Hall Publication.
6. Methews, G. (2011): Integrated Vector Management: Controlling Vectors of Malaria and other Insect Vector borne Diseases. Wiley-Blackwell.

SHRI GOVIND GURU UNIVERSITY, GODHRA**B.Sc. ZOOLOGY - SEMESTER-III****MAJOR COURSE - 2 (THEORY)****BS23MJ3ZO2****[Physiology, Fisheries, Wildlife Biology, Animal Behaviour]****Total Credit - 04****04 Lectures/Week**

UNIT	TOPICS	CREDIT	HOURS
Unit-I	<ul style="list-style-type: none">• Composition of human blood• Detail study of cellular components of blood (Amount, structure, functions)• Haemopoiesis• Blood coagulation (Factors involved in blood coagulation)• Blood transfusion (Typing and cross matching)• Anemia Types – Nutritional, pernicious, Hemorrhagic, Hemolytic, Aplastic and sickle cell	1	15
Unit-II	<ul style="list-style-type: none">• Study of fishing gears<ul style="list-style-type: none">- Nets: Gill net, Cast net, Drag net, Trawl net- Boats: Non-Mechanized (Macchwa, Rampani boat), Mechanized (Trawler)• Types of scales and fins in fishes• Identification and Classification of fishes up to family (Catla, Rohu, Mrigal, Hilsa, Dara, Ghol, Bombay duck, Pomfret)• Home aquarium: Introduction, construction, maintenance, popular aquarium fishes (Ornamental fishes)	1	15
Unit-III	<ul style="list-style-type: none">• <i>In-situ</i> and <i>Ex-situ</i> conservation of Biodiversity• Difference between National Parks and Sanctuaries• National Parks and Sanctuaries of Gujarat<ul style="list-style-type: none">- Marine National Park, Velavadar National Park, Gir National Park, Vansada National Park, Jambughoda Wildlife Sanctuary and Ratanmahal Sloth Bear Sanctuary (Location, Area (sq.km), Major faunal diversity only)• Biosphere Reserves of India<ul style="list-style-type: none">- Three zones (Core, Buffer and Transitional)• Biodiversity hotspots – Criteria and list of Biodiversity hotspots of India• IUCN Red data list: Only categories [Extinct, Critically Endangered, Endangered, Vulnerable, Least concerned]• Wildlife Conservation Projects – Gir Lion Project, Project Tiger, Project Elephant, Indian Rhino Vision 2020	1	15

Unit-IV	<ul style="list-style-type: none"> • Introduction to Ethology • Learning behavior • Types of Learning <ul style="list-style-type: none"> - Habituation - Classical conditioning - Trial and error - Latent Learning - Imprinting - Insight learning - Social life of Termites 	1	15
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References:

1. Principles of Anatomy & Physiology, Tortora and Grabowski, Harper Collins College Pub.
2. Animal Physiology and Related Biochem. H. R. Singh, Shobhan Lal Naginchand & Co. Edu. Pub., Jalandhar.
3. Fish & Fisheries of India, V. B. Jhingran, Hindustan Pub., Meerut.
4. Fishery Science and Indian Fisheries, Srivastav, Kitab Mahal Pub., Delhi.
5. Fishes, Chandy.
6. Gautam S, Mazumdar S: Wildlife Biology: An Indian Perspective, New Delhi (DL); PHI Learning, 2017.
7. Indian Wildlife, Srilanka, Nepal, APA Publications.
8. Wildlife of India, Mark E. Trisch, HarperCollins Pub.
9. Animal Behaviour, Mohan P. Arora, Himalaya Publishing House.
10. Essentials of Behaviour, P. J. B. Slater, Cambridge Univ. Press.
11. An Introduction to Animal Behaviour, Manning, Addition Wesley.

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-III
MAJOR COURSE - Practical-A
BS23MJ3ZO3
(Based on Major Course - 1)
[Pollution, Vector Borne Diseases, Ecology]

Total Credit - 02

LIST OF PRACTICALS

I. POLLUTION:

1. To estimate following physico–chemical parameters of water by titrimetric method
 - a) Total hardness
 - b) Calcium hardness

II. VECTOR BORNE DISEASES:

Study of Insect vectors – Mosquitoes, Flies, Fleas, Ticks, Bugs, Lice, Mites, Cyclops, Cockroach through permanent slides / specimens / photographs.

III. ECOLOGY:

1. To study types of coral reefs (fringing reef, barrier reef, atolls) through charts
2. To study various biomes using charts: Tundra, Savana, Grassland, Desert and Tropical Rain Forests
3. To estimate following physico-chemical parameters of pond water by titrimetric method
 - a) Acidity
 - b) Alkalinity
4. Study of structure of lentic and lotic ecosystem through chart
5. Study of structure of marine ecosystem through chart

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-III
MAJOR COURSE - Practical-B
BS23MJ3ZO3
(Based on Major Course - 2)
[Physiology, Fisheries, Wildlife Biology, Animal Behaviour]

Total Credit - 02

LIST OF PRACTICALS

I. BLOOD PHYSIOLOGY:

1. To study the composition of blood preparing blood smear/Permanent slide.
2. To study differential WBC through human blood smear preparation/Permanent slide:

II. FISHERIES:

1. Study of fishing gears through charts/Models:
 - i. Fishing nets: Gillnet, Cast net, Drag net, Trawl net
 - ii. Boats:
 - Non-mechanized boats – Machchva, Rampani
 - Mechanized boat – Trawlers
2. Identification of Fishes:
Rohu, Catla, Pomfret, Mrigal, Hilsa, Dara, Ghol, Bombay Duck

III. WILDLIFE BIOLOGY:

1. National Park & Wildlife Sanctuary (as per theory syllabus) spotting in map of Gujarat
2. Submit a field report of Herpato fauna, Avian fauna and Mammalian fauna of selected area

IV. ANIMAL BEHAVIOUR:

1. To study human behavior by trial and error