

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

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-III
MULTIDISCIPLINARY COURSE (MDC) – THEORY
BS23MD3ZO1
(Fundamentals of Ecology)

Total Credit - 02

02 Lectures/Week

UNIT	TOPICS	CREDIT	HOURS
Unit-I	<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 ● Biotic Community <ul style="list-style-type: none"> - Concept of community - Community stratification in terrestrial habitat ● Ecological Succession <ul style="list-style-type: none"> - Kinds of succession - Process of succession - Patterns of succession (Hydrosere, Xerosere) - Significance of ecological succession 	1	15
Unit-II	<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) - 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.

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-III
MULTIDISCIPLINARY COURSE (MDC) – PRACTICAL
BS23MD3ZO1
(Fundamentals of Ecology)

Total Credit - 02

LIST OF PRACTICALS

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

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-III
SKILL ENHANCEMENT COURSE (SEC) – THEORY
BSC23SE304
(Sericulture)

Total Credit - 02

02 Lectures/Week

UNIT	TOPICS	CREDIT	HOURS
Unit-I	<ul style="list-style-type: none"> • Introduction of sericulture • Classification of silkworm (<i>Bombyx mori</i>) • External features and Life cycle of <i>Bombyx mori</i> • Species of silkworm used for sericulture • Requirements for sericulture 	1	15
Unit-II	<ul style="list-style-type: none"> • Rearing of silkworm <ul style="list-style-type: none"> - Grainage management - Post-cocoon processing (Stifling, Reeling & spinning) • Diseases of silkworm • Economic importance of silk • Status of Sericulture industry in India • Major silk research institutes in India 	1	15

References:

1. Applied Zoology: N. Arumugam, T. Murugan, J. Johnson Rajeswar and R. Ram Prabu, Saras Publication
2. Economic Zoology: Sagarika Chaudhuri, New Central Book Agency.
3. Economic Zoology: G.S. Shukla and V.B. Upadhyay, Rastogi Publication.

SHRI GOVIND GURU UNIVERSITY, GODHRA

B.Sc. ZOOLOGY - SEMESTER-IV

MAJOR COURSE - 1 (THEORY)

BS23MJ4ZO1

[Animal Diversity (Chordates), Parasitology, Genetics]

Total Credit - 04

04 Lectures/Week

UNIT	TOPICS	CREDIT	HOURS
Unit-I	<ul style="list-style-type: none">• General characters and classification of Protochordata, Cyclostomata, Pisces and Amphibia, starting from kingdom up to orders with reasons and examples (as per practical syllabus)• Type study - Shark (<i>Scoliodon sorrakowah</i>) - Classification, External characters, Placoid scales, Digestive system, Circulatory system (Heart and Arterial system only), Nervous system (Brain), Receptors (Ampullae of Lorenzini, Internal ear), Urinogenital system	1	15
Unit-II	<ul style="list-style-type: none">• Differences between Chondrichthyes and Osteichthyes• Swim bladder in Fishes• Accessory respiratory organs in Fishes• Parental care in Fishes• Parental care in Amphibians• Neoteny in Amphibians	1	15
Unit-III	<ul style="list-style-type: none">• General Introduction: Parasite, Host-Parasite relationship• Types of Parasites: Endoparasites (Obligate, Facultative), Exoparasite• Types of Hosts: Definitive, Intermediate, Reservoir• Morphology, life cycle, pathogenesis, diagnosis & prophylaxis of the following parasites:<ul style="list-style-type: none">- Protozoan parasites: <i>Entamoeba histolytica</i>, <i>Leishmania donovani</i>- Helminthes parasites: <i>Taenia solium</i>, <i>Wuchereria bancrofti</i>	1	15

Unit-IV	<ul style="list-style-type: none"> • Dominant Epistasis • Sex determination in animals <ul style="list-style-type: none"> - Sex determination in Drosophilla (Genetic balance theory and XX, XO, XY method), Gynandromorph - Sex determination in Human • Chromosome: Classification on the basis of Centromere's Location, Giant (polytene) Chromosome • Microscopy <ul style="list-style-type: none"> - Phase contrast microscope - Fluorescence microscope 	1	15
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References:

1. Textbook of Vertebrates, R.L. Kotpal, Rastogi Publication, Meerut.
2. Chordate Zoology, P. S. Dhama, and J. K. Dhama, S. Chand & Co., Delhi.
3. Jordan E. L. and Verma P. S. Vertebrate Zoology, S. Chand publishing. New Delhi.
4. Medical Parasitology, CK Jayram Paniker, Jaypee Brothers Medical Publishers, New Delhi.
5. Protozoa, R. L. Kotpal, Rastogi Publications, Meerut.
6. Helminthes, R. L. Kotpal, Rastogi Publications, Meerut.
7. An Introduction to Parasitology, P. N. Sharma, L. S. Ratnu, S. Chand & Co. Ltd., New Delhi.
8. Textbook of Genetics, Veerbala Rastogi, Kedar Nath Ram Nath, Meerut.
9. Genetics, P.S.Verma & V.K.Agarwal, S. Chand & Company, Delhi.
10. Cell Biology, C. B. Power, Himalaya Publishing House.

SHRI GOVIND GURU UNIVERSITY, GODHRA

B.Sc. ZOOLOGY - SEMESTER-IV

MAJOR COURSE - 2 (THEORY)

BS23MJ4ZO2

[Animal Diversity (Chordates), Physiology, Evolution]

Total Credit - 04

04 Lectures/Week

UNIT	TOPICS	CREDIT	HOURS
Unit-I	<ul style="list-style-type: none">• General characters and classification of Reptilia, Aves and Mammalia, starting from kingdom up to orders with reasons and examples (as per practical syllabus)• Type study – Garden Lizard (<i>Calotes versicolor</i>): Classification, External characters, Digestive system, Circulatory system (Heart, Arterial system, Venous system), Nervous system – Brain, Urinogenital system	1	15
Unit-II	<ul style="list-style-type: none">• Temporal fossae in Reptiles• Identification of venomous and non-venomous snakes<ul style="list-style-type: none">- Venomous: Russel's viper, Krait, Cobra, King Cobra, Marine Snake- Non-venomous: Boa, Python, Rat snake• Dinosaurs (Brontosaurus, Triceratops, Tyrannosaurus, Dimetrodon, Stegosaurus, Pteranodon, Ichthyosaurus, Iguanodon)• Animal adaptations: Cursorial, Fossorial, Arboreal, Volant, Desert, Deep sea	1	15
Unit-III	<ul style="list-style-type: none">• Body fluids: Introduction, Significance, Compartments, Composition• Dehydration, Water Intoxication (Overhydration)• Composition of Cerebrospinal fluid (CSF)• Composition of Milk• Physiology of Digestion (Ingestion, Digestion, Absorption, Assimilation, Egestion).• Digestion of carbohydrates, protein and lipids.	1	15

Unit-IV	<ul style="list-style-type: none"> • Evolutionary theories <ul style="list-style-type: none"> - Origin of life - Lamarckism - Darwinism - Neo Darwinism • Phylogeny of Horse • Source of variation <ul style="list-style-type: none"> 1. Gene mutation 2. Chromosomal mutation <ul style="list-style-type: none"> a. Change in number b. Change in structure 	1	15
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References:

1. Textbook of Vertebrates, R.L. Kotpal, Rastogi Publication, Meerut.
2. Chordate Zoology, P. S. Dhami, and J. K. Dhami, S. Chand & Co., Delhi.
3. Jordan E. L. and Verma P. S. Vertebrate Zoology, S. Chand publishing. New Delhi.
4. Principles of Anatomy and Physiology, Tortora and Grabowski, Harper Collins College Publications.
5. Essentials of Medical Physiology, K. Sembulingam and Prema Sembulingam, Jaypee publications.
6. Animal Physiology and Related Biochemistry, H. R. Singh, Shobhan Lal Nagin Chand & Co., Educational Publishers, Jalandhar.
7. Veer Bala Rastogi (2017) Organic Evolution. Med Tech.
8. Evolution. Hall, B. K. and Hallgrimsson, B. IV edition. Jones and Bartlett Publishers.
9. Evolution. Futuyma, Douglas J. and Kirkpatrick Mark. (4th Edition) Sinauer.

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-IV
MAJOR COURSE - Practical-A
BS23MJ4ZO3
(Based on Major Course - 1)
[Animal Diversity (Chordates), Parasitology, Genetics]

Total Credit - 02

LIST OF PRACTICALS

I. (A) ANIMAL DIVERSITY (Chordates) – Systematics:

Identification & Classification of following animals up to Orders, giving reasons:

1. Protochordata: Amphioxus, Doliolum, Ascidian.
2. Cyclostomata: Lamprey, Hagfish.
3. Pisces: Rohu, Sting ray fish, Electric ray fish, Sea horse, Suckerfish, Eel.
4. Amphibia: Ichthyophis, Salamander, Hyla.

(B) STUDY OF SHARK (*Scoliodon sorrakowah*):

1. Study of external characters.
2. Study of Digestive system, Arterial system, Urinogenital systems, Brain.
3. Study of Placoid scales, Membranous Labyrinth, Ampulla of Lorenzini

II. ANIMAL DIVERSITY (Chordates):

Study by charts/models/specimens to learn peculiarities of:

1. Swim bladder in Fishes
2. Accessory respiratory organs in Fishes
3. Parental care in Fishes (Male Hippocampus, Male Kurtus, Male Arius, Female Tilapia).
4. Parental care in Amphibians (Alytes, Pipa, Rhacophorus, Hyla, Rhinoderma).

III. PARASITOLOGY:

1. Study of *Entamoeba histolytica*, *Leishmania donovani*, *Taenia solium*, *Wuchereria bancrofti* and their life stages through permanent slides / specimens / photographs.

IV. GENETICS:

1. Dominant Epistasis
2. Sex determination in *Drosophila*
3. Sex determination in Human
4. Study of polytene chromosome through chart
5. Phase contrast microscope
6. Fluorescence microscope

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-IV
MAJOR COURSE - Practical-B
BS23MJ4ZO3
(Based on Major Course - 2)
[Animal Diversity (Chordates), Physiology, Evolution]

Total Credit - 02

LIST OF PRACTICALS

I. (A) ANIMAL DIVERSITY (Chordates) – Systematics:

Identification & Classification of following animals up to Orders, giving reasons:

1. Reptilia: Tortoise, Tuatara, House Gecko, Cobra, Python, Crocodile, Gavialis.
2. Aves: Ostrich, Emu, Penguin, Flamingo, Peacock, Parrot, Wood pecker, Crow, Sparrow.
3. Mammalia: Koala, Kangaroo, Bat, Lion, Seal, Blue whale, Horse, Rat, Rabbit, Chimpanzee.

(B) STUDY OF GARDEN LIZARD (*Calotes versicolor*):

1. Study of external characters.
2. Study of Digestive system, Heart, Arterial system, Venous system, Brain, Urinogenital system.

II. ANIMAL DIVERSITY (Chordates):

Study by charts/models/specimens to learn peculiarities of:

1. Temporal fossae
2. Identification of venomous and non-venomous snakes by charts:
 - Venomous: Russel's viper, Krait, Cobra, King Cobra, Marine Snake
 - Non-venomous: Boa, Python, Rat snake
3. Dinosaurs (Brontosaurus, Triceratops, Tyrannosaurus, Iguanodon, Stegosaurus, Pteranodon, Ichthyosaur, Plesiosaur)
4. Animal adaptations:
 - i. Cursorial: Ostrich, Horse
 - ii. Arboreal: Squirrel, Hyla, Chameleon
 - iii. Volant: Bat, Birds
 - iv. Desert: Phrynosoma, Camel
 - v. Deep sea: Blue whale, Sole fish

III. PHYSIOLOGY:

1. To study the action of Salivary Amylase on Starch.

IV. EVOLUTION:

1. Study of Evolution of horse through charts/models
2. Study of examples supporting Lamarkism and Darwinism

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-IV
MINOR COURSE - THEORY
BS23MN4ZO1
(Diversity of Chordates)

Total Credit - 02

02 Lectures/Week

UNIT	TOPICS	CREDIT	HOURS
Unit-I	<ul style="list-style-type: none"> • General characters of Protochordata, Cyclostomata, Pisces and Amphibia • Differences between Chondrichthyes and Osteichthyes • Swim bladder in Fishes • Accessory respiratory organs in Fishes • Parental care in Fishes • Parental care in Amphibians • Neoteny in Amphibians 	1	15
Unit-II	<ul style="list-style-type: none"> • General characters of Reptilia, Aves and Mammalia • Temporal fossae in Reptiles • Identification of venomous and non-venomous snakes <ul style="list-style-type: none"> - Venomous: Russel's viper, Krait, Cobra, King Cobra, Marine Snake - Non-venomous: Boa, Python, Rat snake • Types of snake venom (Neurotoxic, Haemotoxic) • Dinosaurs (Brontosaurus, Triceratops, Tyranosaurus, Dimetrodon, Stegosaurus, Pteranodon, Ichthyosaurus, Iguanodon) • Animal adaptations: Cursorial, Fossorial, Arboreal, Volant, Desert, Deep sea 	1	15

References:

1. Textbook of Vertebrates, R.L. Kotpal, Rastogi Publication, Meerut.
2. Chordate Zoology, P. S. Dhami, and J. K. Dhami, S. Chand & Co., Delhi.
3. Jordan E. L. and Verma P. S. Vertebrate Zoology, S. Chand publishing. New Delhi.

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-IV
MINOR COURSE - Practical
BS23MN4ZO1
(Diversity of Chordates)

Total Credit - 02

LIST OF PRACTICALS

- I.** Study by charts/models/specimens to learn peculiarities of:
1. Swim bladder in Fishes
 2. Accessory respiratory organs in Fishes
 3. Parental care in Fishes (Male Hippocampus, Male Kurtus, Male Arius, Female Tilapia).
 4. Parental care in Amphibians (Alytes, Pipa, Rhacophorus, Hyla, Rhinoderma).
- II.** Study by charts/models/specimens to learn peculiarities of:
1. Temporal fossae
 2. Identification of venomous and non-venomous snakes by charts:
 - Venomous: Russel's viper, Krait, Cobra, King Cobra, Marine Snake
 - Non-venomous: Boa, Python, Rat snake
 3. Dinosaurs (Brontosaurus, Triceratops, Tyrannosaurus, Iguanodon, Stegosaurus, Pteranodon, Ichthyosaur, Plesiosaur)
 4. Animal adaptations:
 - i. Cursorial: Ostrich, Horse
 - ii. Arboreal: Squirrel, Hyla, Chameleon
 - iii. Volant: Bat, Birds
 - iv. Desert: Phrynosoma, Camel
 - v. Deep sea: Blue whale, Sole fish

SHRI GOVIND GURU UNIVERSITY, GODHRA
B.Sc. ZOOLOGY - SEMESTER-IV
SKILL ENHANCEMENT COURSE (SEC) – THEORY
BSC23SE404
(Lac culture)

Total Credit - 02

02 Lectures/Week

UNIT	TOPICS	CREDIT	HOURS
Unit-I	<ul style="list-style-type: none"> • Introduction of Lac culture • Classification of Lac insect (<i>Tachardia lacca</i>) • External features and Life cycle of <i>Tachardia lacca</i> • Host plants for lac culture • Cultivation of Lac <ul style="list-style-type: none"> - Pruning - Inoculation - Harvesting 	1	15
Unit-II	<ul style="list-style-type: none"> • Lac cultivation Methods <ul style="list-style-type: none"> - Coupe system - Alteration of plants • Composition and Properties of Lac • Enemies of Lac culture • Economic importance of Lac 	1	15

References:

1. Applied Zoology: N. Arumugam, T. Murugan, J. Johnson Rajeswar and R. Ram Prabu, Saras Publication
2. Economic Zoology: Sagarika Chaudhuri, New Central Book Agency.
3. Economic Zoology: G.S. Shukla and V.B. Upadhyay, Rastogi Publication.