

SARDAR PATEL UNIVERSITY
SECOND YEAR B.Sc. (THIRD SEMESTER)
BIOLOGY
US03CBIO21 (T) CONCEPT OF BIOLOGY
(Four Credit Course, Four hours per week)
Effective from June-2019
(Total Marks-100, Internal 30 marks, External-70 marks)

UNIT 1: BIOLOGY – THE SCIENCE OF LIFE

Characteristics and Properties of life, Origin of life: three Hypothesis, The early earth, Major steps in evolution of Life, Theory of Evolution by Charles Darwin, Origin of Cells, History of cell, Structure of Prokaryotic cell, Structure of Eukaryotic cell (Cell wall, Cell membrane, Nucleus, Endoplasmic Reticulum, Golgi body, Mitochondria, Chloroplast, Ribosome), Cell Division: Mitosis and Meiosis with significance.

UNIT 2: PHYSIOLOGICAL PROCESSES

Brief account of **Diffusion, Osmosis, Plasmolysis, Imbibition, Transpiration**

Respiration- Glycolysis, Krebs cycle, Electron Transport Chain, ATP generation

Photosynthesis: Structure of stomata, Light reaction (cyclic and noncyclic photophosphorylation), Dark reaction/Calvin cycle, C3 and C4 plants, Crassulacean Acid Metabolism

UNIT 3: CONCEPT OF GENE

Chromosomes: Morphology, structure and chemical composition, Karyotype, Euchromatin and Heterochromatin

Genetic material: Nucleic acids- DNA and RNA, Nitrogen bases, Nucleoside, Nucleotide
Watson and Crick's structural model of DNA.

Different forms of DNA

RNA- Structure of RNA, mRNA, t RNA and r RNA

Modern concept of gene

UNIT 4: GENE EXPRESSION

Transcription- Comparison between DNA replication and transcription, Mechanism of prokaryotic transcription, Mechanism of Eukaryotic transcription.

Post transcriptional modifications.

Translation-Central Dogma

Stages of protein synthesis in prokaryotes and Eukaryotes.

SUGGESTED READINGS:

- Genes: Lewin, Jones and Barlett Publishers
- Cell and Molecular Biology: De Roberties, Lipincott Williams and Williams (2008)
- Biochemistry-Lehninger Copyright 2011 Macmillan Pulishers Limited
- Cell Biology: Singh and Tomar
- Fundamentals of Biochemistry: J.L. Jain (publisher-s.chand group)
- Elementary Biochemistry: J.L. Jains (s.chand group)
- Cell Biology, Genetics, Molecular Biology, Evolution and Ecology: P.S. Verma and V.K.Agarwal.(S. Chand and Company Ltd, New Delhi.
- Cell and Molecular Biology by Karp 5th Ed., ISBN 0471465801

Sardar Patel University
Second Year B.Sc. (Third Semester)
Biology
US03CBIO22(T) - Applied Zoology
(Four Credit Course, Four hours per week)
(Effective from June 2019)
(Total Marks 100, Internal-30 marks, External 70-marks)

UNIT 1 - ECONOMIC ZOOLOGY

Apiculture – Species of honey bees, Life history, Methods of Bee keeping, Appliances of modern method, Products of Bee keeping

Lac Culture – Life history, Host plants, Cultivation of lac, Processing of lac, Economic importance

Seri Culture – Species of silkworm, Life history of Mulberry silkworm, Sericulture industry, Rearing of silkworm

Pearl Culture – Pearl producing Molluscs, Pearl producing sites in India, Pearl formation, Harvesting of Pearl, Composition and quality of Pearl

Fish Culture – Aim of Fish culture, Types of cultivable fishes, Types of Culture in India, External factors affecting Fish Culture, Management of Fish Culture Programme

Poultry Farming – Fowl House, Food and Feeding of Fowls, Breeds of Fowls, Indigenous breeds, Improved or Exotic Breeds, Breeding in fowls, Eggs and Hatching, Selection and Treatment of Eggs, Precautions for Hatching, Disease of Poultry

UNIT 2 - ANIMAL ADAPTATIONS

Terrestrial Adaptations: Desert, Burrowing, Cursorial, Arboreal, Volant

Aquatic Adaptations: Fresh water and Marine water

Special Adaptations: Mimicry in insects and birds, Camouflage in insects and reptiles, Echolocation In Bats, Electric Organ In Fish

UNIT 3 - ANIMAL PARASITOLOGY

Life Cycle and Pathogenicity Of

Protozoan Parasites (Balantidium coli, Leishmania donovani, Trypanosoma gambiense)

Helminthic Parasites (Ancylostoma duodenale, Enterobius vermicularis, Ascaris lumbricoides)

UNIT 4 - WILDLIFE BIOLOGY

Introduction, Wildlife of Gujarat based on habitats

Importance of Wildlife, Vanishing Wildlife,

Concept of Threatened Species – Critically endangered, Endangered, Vulnerable and Data deficient

Special Projects for Endangered Species – Project Tiger, Gir Lion Project, Crocodile Breeding Project, Project Elephant

Wildlife Management in India

National Parks and Sanctuaries of Gujarat

(* Designed following UGC Curriculum)

SUGGESTED READINGS:

Modern Textbook of Zoology-Vertebrate by R. L. Kotpal

Medicinal Parasitology by Rajesh Karyakarte, Ajit Damle

Economic Zoology by Shukla and Upadhyay

Environmental Biology and Toxicology by P.D. Sharma

Medical Parasitology by Dey and Dey

SARDAR PATEL UNIVERSITY
SECOND YEAR B.Sc. (THIRD SEMESTER)
BIOLOGY
US03CBIO 23(P) PRACTICAL BASED ON CONCEPT OF BIOLOGY
(Two Credit Course, four hours per week)
Effective from June-2019
(Total Marks-50, External-50 marks)

1. Study of prokaryotic cell structure-Bacteria (Temporary mount/PS)
2. Study of Plant cellular organization- Eukaryotic cell (Onion scaly leaf)
3. To demonstrate the importance of living membrane
4. Study of stomata (Epidermal leaf peeling)
5. Various cell division stages of mitosis from onion root tips.
6. Various cell division stages of meiosis from flower buds/PS
7. Micrometry for determination of cell size
8. To demonstrate the phenomenon of Imbibition
9. Study the phenomenon of Cell plasmolysis (Tradescantia/ Rhoeo leaf)
10. To demonstrate the process of Endosmosis and Exosmosis
11. To demonstrate water loss (Transpiration) from leaf surface
12. To demonstrate stomatal transpiration by four leaves method
13. To demonstrate that oxygen is liberated during photosynthesis.
14. Determination of chlorophyll by absorption spectra
15. To study the R. Q. of different respiratory substrates by Ganong's respirometer
16. To demonstrate liberation of CO₂ during aerobic respiration
17. Separation of Leaf pigments by paper chromatography
18. Study of Polytene chromosomes (Chironemous larvae/ PS)
19. Estimation of DNA by DPA method.
20. Estimation of RNA by Orcinol method
21. Estimation of Protein by Folin Lowry method

Sardar Patel University
Second Year B.Sc. (Third Semester)
Biology
(Two Credit Course, Four hours per week)
(Effective from June 2019)
(Total Marks 50)

1. Study of life cycle of honey bee, silk moth, lac insect
2. Study of pearl culturing
3. Study of animals exhibiting terrestrial adaptations using specimen (Desert, Burrowing, Arboreal)
4. Study of animals exhibiting aquatic adaptations using specimen (Fresh water and Marine water)
5. Study of animals exhibiting special adaptations using specimen (Mimicry, Camouflage, Electric organ, Echolocation)
6. Study of parasites (Protozoan and Helminthic)
7. Study of endangered animals of Gujarat (Mammals, Reptiles, Birds and Amphibian)
8. Field visit for studying apiculture (Report Submission)
9. Visit to fish farm and poultry farm (Report Submission)
10. Visit to study wildlife in Gujarat (National Park/Sanctuary/Zoo) (Report Submission)

SUGGESTED READINGS:

Manual of Practical Zoology Chordate by- P.S. Verma
Medical Parasitology by Dey & Dey
Manual of Practical Zoology Invertebrates by P.S. Verma