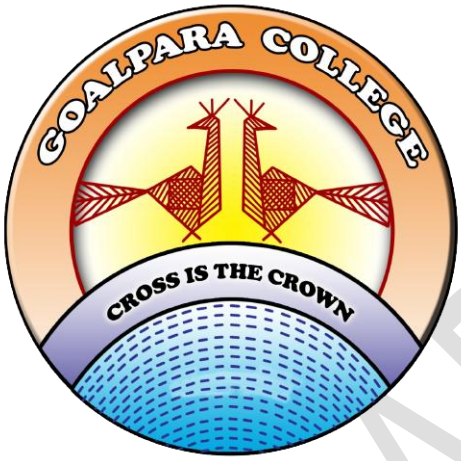
PROGRAM BROCHURE



A Syllabus of

Four-Years Undergraduate Program (FYUGP)

in

ZOOLOGY

As per instructions of the NEP 2020 Framework

For the First Year of UG Zoology to be effective from 2026

Prepared by-

Department of Zoology,
Goalpara College (Autonomous)
Goalpara, Assam

GOALPARA COLLEGE (AUTONOMOUS)
ZOOLOGY SEMESTER-I
MAJOR/MINOR-1
DIVERSITY OF NON-CHORDATES
CODE: ZOO-01-MJC-10101/ZOO-01-MNC-10101/ZOO-03-MJC-10101
Credit: 3 (T) + 1 (P)

Course Objectives:

1. The course would provide an insight to the learner about the existence of different life forms on the Earth and appreciate the diversity of animal life.

2. It will help the student to understand the features of Kingdom Animalia and systematic organization of the animals based on their evolutionary relationships, structural and functional affinities.

3. The course will also make the students aware about the characteristic morphological and anatomical features of diverse animals; economic, ecological and medical significance of various animals in human life; and will create interest among them to explore the animal diversity in nature.

4. The course will impart knowledge to the students about the life cycle reproduction and developmental patterns of major non-chordates groups.

5. The course will help the students to develop the comparative understanding of non-chordate biodiversity and appreciate the ecological, evolutionary and economic significance of different invertebrate groups.

Learning Outcome:

Upon completion of the course, students should be able to:

1. Learn about the importance of systematics, taxonomy and structural organization of animals.
2. Apprehend the diversity of non-chordates living in varied habits and habitats.
3. Understand evolutionary history and relationships of different non-chordates through functional and structural affinities.
4. Analyze the organization, complexity and characteristic features of non-chordates making them familiarize with the morphology and anatomy of representatives of various animal phyla.
5. Comprehend the economic importance of non-chordates, their interaction with the environment and role in the ecosystem.

MAJOR/MINOR-1

DIVERSITY OF NON-CHORDATES

CODE: ZOO-01-MJC-1011/ZOO-01-MNC-1011/ZOO-03-MJC-10101

Credit: 3 (T) + 1 (P)

Theory **Hours (45)**

Unit 1: Protozoa 5

General characteristics and classification up to classes; Nutrition, Locomotion and Reproduction in Protozoa.

Unit 2: Porifera, 4

Introduction to Parazoa; General characteristics and classification up to classes; Canal system and spicules in sponges.

Unit 3: Cnidaria 5

Introduction to metazoa; General characteristics and classification up to classes; Metagenesis in obelia, Polymorphism in Cnidaria, Corals and coral reef formation.

Unit 4: Ctenophora 2

General characteristics and classification up to classes; Evolutionary significance of Ctenophora.

Unit 5: Platyhelminthes 4

General characteristics and classification up to classes; Life cycle and pathogenicity of *Fasciola hepatica* and *Taenia solium*, Parasitic adaptations in Platyhelminthes.

Unit 6: Nemathelminthes 4

General characteristics and classification up to classes; Life cycle and pathogenicity of *Ascaris lumbricoides,* Parasitic adaptations in Nemathelminthes.

Unit 7: Annelida 4

General characteristics and classification up to classes; Evolution of coelom and metamerism, Excretion in Annelida. Economic importance of annelida.

Unit 8: Arthropoda 6

General characteristics and classification up to classes**;** Classification of insecta up to order; Vision and respiration in Arthropoda**,** Metamorphosis in insects.

Unit 9: Onychophora 2

General characteristics and evolutionary significance; Connecting link between annelids and arthopods.

Unit 10: Mollusca 4

General characteristics and classification up to classes; Torsion and detorsion in Gastropoda, Pearl producing molluscs, pearl formation in Bivalves.

Unit 11: Echinodermata 5

General characteristics and classification up to classes; Water vascular system in Asteroidea. Larval forms in echinoderms.

DIVERSITY OF NON-CHORDATES

Practical **Hours (**30**)**

1. Study of the whole mount of any one of the following: *Euglena*, *Amoeba, Paramecium. Entamoeba* and *Obelia.*
2. Study of at least two representatives (specimen/slide/model) of each phylum of non-chordates.
3. Study of life cycles of *Ascaris lumbricoides* and *Taenia solium*. (Slide/microphotograph)
4. Dissection of digestive/nervous system of *Periplaneta*.
5. To submit a project report on larval forms of Helminths/Crustaceans/Molluscs/Echinodermata (Photograph/Slides)

Suggested Readings:

1. Ruppert, E.E. and Barnes, R.D. (2006). Invertebrate Zoology, 8th Edition. Holt Saunders International Edition.
2. Jordan, K. and P. S. Verma (2019). Invertebrate Zoology, S. Chand and Co. Ltd.
3. Kotpal, R. L. (2020). Modern textbook of Zoology, Invertebrates,12th Edition, Rastogi Publications.
4. Barrington, E.J.W. (1979). Invertebrate Structure and Functions. II Edition, E.L.B.S. and Nelson
5. Boradale, L.A. and Potts, E.A. (1961). Invertebrates: A Manual for the use of Students. Asia Publishing Home

GOALPARA COLLEGE (AUTONOMOUS)
ZOOLOGY SEMESTER-2
MAJOR/MINOR-2
DIVERSITY OF CHORDATES
Code: ZOO-01-MJC-10102/ ZOO-01-MNC-10102/ZOO-03-MJC-10101
Credit: 3(T)+ 1(P)

Course Objectives:

1. Understand different classes of chordates, level of organization and evolutionary relationship between different subphyla and classes, within and outside the phylum.
2. Study about diversity in animals making students understand about their distinguishing features.
3. Appreciate similarities and differences in life functions among various groups of animals in Phylum Chordata.
4. Comprehend the circulatory, nervous and skeletal system of chordates.
5. Learn about the habit and habitat of chordates in marine, freshwater and terrestrial ecosystems.

Learning Outcomes:

Upon completion of the course, the students will be able to:

1. Explain the origin, general characteristics, evolutionary relationships, and classification of chordates, including protochordates and cyclostomes.
2. Classify the major groups of vertebrates (Pisces, Amphibia, Reptilia, Aves, and Mammalia) up to the class, based on their distinguishing morphological and anatomical characteristics.
3. Describe the structural, physiological and behavioral adaptations of different vertebrate groups.
4. Interpret the evolutionary significance of important chordate groups and concepts and the role of larval forms in understanding chordate evolution.
5. Discuss the principles of zoogeography, including zoogeographical realms and the influence of plate tectonics and continental drift on the distribution and evolution of animals.

MAJOR/MINOR-2
DIVERSITY OF CHORDATES
Code: ZOO-01-MJC-10102/ ZOO-01-MNC-10102/ZOO-03-MJC-10101
Credit: 3(T)+ 1(P)

Theory **Hours (45)**

Unit 1: Introduction to Chordates 5

Origin of Chordates-Dipleurula concept and Echinoderm theory

General characteristics and outline classification

Unit 2: Protochordata 6

General characteristics of Hemichordata, Urochordata and Cephalochordata

Study of morphology of at least one representative of each.

Unit 3:Agnatha 3

General characteristics and classification of cyclostomes with example

Unit 4:Pisces 8

General characteristics of Chondrichthyes and Osteichthyes, classification up to order, Osmoregulation in fishes, Migration and Parental care in fishes.

Unit 5:Amphibia 5

Origin of Tetrapoda, General characteristics and classification of Amphibia up to order; Parental care in Amphibia

Unit 6:Reptilia 6

General characteristics and classification up to order; Poison apparatus and Biting mechanism in snakes, Evolutionary significance of Sphenodon.

Unit 7:Aves 7

General characteristics and classification up to order; Perching mechanism, flight adaptations and migration in birds

Unit 8:Mammals 5

General characteristics and classification up to order; Adaptive radiation in mammals with reference to locomotory appendages

Practical **Hours: 30**

1. Study of museum specimens/Models

Protochordata: *Balanoglossus*, *Herdmania*, *Amphioxus*

Agnatha: *Petromyzon, Myxine*

Fishes: *Scoliodon, Torpedo, Mystus, Heteropneustes, Labeo, Hippocampus, Tetraodon, Anabus*

Amphibia: *Ichthyophis, Necturus, Bufo, Hyla, Salamander*

Reptilia: *Chelone, Hemidactylus, Varanus, Chamaeleon, Bungarus, Naja, Hydrophis*

Aves: 10 different species of birds commonly found in Assam

Mammalia: Bat, common primates, common ungulates, Gangetic River Dolphin

2. Study of TS of *Amphioxus* through pharyngeal, intestinal, and caudal regions,
3. Placoid and Cycloid scales in Fishes
4. Types of beaks and claws in birds
5. Identification of venomous and non-venomous snakes

Suggested Readings

1. Young, J.Z. (2004). The Life of Vertebrates. III Edition. Oxford University press,
2. Pough, F.H. & Janis, C.M. (2018). Vertebrate Life. X Edition, Sinauer Associates.
3. Verma, P.S. & Jordan, E.L. (2013). Chordate Zoology. XIV Edition, S. Chand.
4. Kotpal, R.L. (2019). Modern text book of Zoology: Vertebrates (Z-3). V Edition, Rastogi Publications.
5. Darlington, P.J. (1980). The Geographical Distribution of Animals. R.E. Krieger Pub Co.
6. Hall, B.K. (2007). Strickberger's Evolution. IV Edition, Jones and Bartlett Publishers Inc.