Module Code:	Zool - 103
Module title:	Zoology – II (Chordates Diversity)
Name of Scheme:	BS Chemistry (4 Years)
Semester :	2nd
Module Type:	General
Module Rating:	2 Credits

1. Introduction of the Course:

The course is organized to provide an adequate knowledge about chordates and their diversity.

2. Course Objectives

The course is designed:

1. To introduce students about the chordates and their evolutionary perspectives.
2. To introduce about characters and classification of Chordates.

3. Course Contents

CHORDATES DIVERSITY:

Echinoderms:

Evolutionary perspective: relationships to other animals; echinoderm characteristics; classification up to class. Asteroidea, ophiuroidea, echinoidea, holothuroidea and crinoidea; some lesser-known invertebrates: the lophophorates, entoprocts, cycliophores, and chaetognaths.

Invertebrates, Hemichordates & Chordates: Evolutionary Perspective: Phylogenetic Relationships; Classification up to subphylum or class where applicable; Further Phylogenetic Considerations.

Fishes: Vertebrate Success in Water:

Evolutionary perspective: phylogenetic relationships; survey of super class agnatha and gnathostomata; further phylogenetic considerations.

Amphibians: The First Terrestrial Vertebrates:

Evolutionary perspective: phylogenetic relationships; survey of order caudata, gymnophiona, and anura. Evolutionary pressures: further phylogenetic considerations.

Reptiles: The First Amniotes:

Evolutionary perspective: cladistic interpretation of the amniotic lineage; survey of order testudines or chelonia, rhynchocephalia, squamata, and crocodilia; evolutionary pressures: adaptations in external structure and locomotion, further phylogenetic considerations.

Birds: Feathers, Flight and Endothermy:

Evolutionary perspective: phylogenetic relationships; ancient birds and the evolution of flight; diversity of modern birds; evolutionary pressures: adaptation in external structure and locomotion, nutrition and the migration and navigation.

Mammals: Specialized Teeth, Endothermy, Hair and Viviparity:

Evolutionary perspective: diversity of mammals; evolutionary pressures: adaptations in external structure.

4. Teaching-learning Strategies

1. Lectures
2. Group Discussion
3. Laboratory work
4. Seminar/ Workshop

5. Learning Outcome:

1. Students are expected to get familiarized with the basic concepts of chordates diversity.
2. They will learn about the fundamentals of characters and classification of different chordates.

6. **Assessment Strategies**:

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

7. Recommended Readings:

1. Miller, S.A. and Harley, J.B., 1999 & 2002. Zoology, 4th & 5th Edition (International). Singapore: McGraw Hill.
2. Hickman, C.P., Roberts, L.S. and Larson, A., 2004. Integrated Principles of Zoology, 11th Edition (International). Singapore: McGraw Hill.
3. Pechenik, J.A., 2000. Biology of Invertebrates, 4th Edition (International). Singapore: McGraw Hill.
4. Kent, G.C. and Miller, S., 2001. Comparative Anatomy of Vertebrates. New York: McGraw Hill.
5. Campbell, N.A., 2002. Biology Sixth Edition. Menlo Park, California: Benjamin/Cummings Publishing Company, Inc

Module Code:	Zool - 104
Module title:	Zoology – II (Zoology Lab)
Name of Scheme:	BS Chemistry (4 Years)
Semester :	2nd
Module Type:	General
Module Rating:	1 Credits

1. Introduction of the Course:

The course is organized to provide an adequate knowledge about chordates and their diversity.

2. Course Objectives

The course is designed:

1. To introduce students about the chordates and their evolutionary perspectives.
2. To introduce about characters and classification of Chordates.

3. Course Contents

Practicals:

Chordates Diversity:

1. Study of a representative of hemichordate and invertebrate chordate.
3. Study of representative groups of class fishes.
4. Study of representative groups of class Amphibia.
5. Study of representative groups of class Reptilia.
6. Study of representative groups of class Aves.
7. Study of representative groups of class Mammalia.
8. Field trips to study animal diversity in an ecosystem.

Developmental Biology-I

1. Study of male reproductive system in an invertebrate and a vertebrate representative (Dissection).
2. Study of female reproductive system in an invertebrate and a vertebrate representative (Dissection).
3. Study of preserved advanced stages of avian and mammalian development for amniotic membranes and placenta (Model).

4. Teaching-learning Strategies

1. Lectures
2. Group Discussion

3. Laboratory work
4. Seminar/ Workshop

5. Learning Outcome:

1. Students are expected to get familiarized with the basic concepts of chordates diversity.
2. They will learn about the fundamentals of characters and classification of different chordates.

6. **Assessment Strategies**:

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

7. <u>Recommended Readings</u>:

1. Miller, S.A. and Harley, J.B., 1999 & 2002. Zoology, 4th & 5th Edition (International). Singapore: McGraw Hill.
2. Hickman, C.P., Roberts, L.S. and Larson, A., 2004. Integrated Principles of Zoology, 11th Edition (International). Singapore: McGraw Hill.
3. Pechenik, J.A., 2000. Biology of Invertebrates, 4th Edition (International). Singapore: McGraw Hill.
4. Kent, G.C. and Miller, S., 2001. Comparative Anatomy of Vertebrates. New York: McGraw Hill.
5. Campbell, N.A., 2002. Biology Sixth Edition. Menlo Park, California: Benjamin/Cummings Publishing Company, Inc