Wollo University
College of Natural Sciences
Department of Biology
Course guidebook

Department: *Biology*	**Module Code:** ***03***
Module Title: *Zoological Science*	**Module Credit:** ***27***
Course Title: *Vertebrate Zoology*	**Course code:** *Biol2034*
Credit: *4 (3 Theoretical classes + 1 Practical/week)*	**ECTS:** ***7***
Instructors name: *Dr. K. S. Goudar*	**Mode of delivery:** *Semester Based*
Instructors contact information:	**Course information:**
Office: Office Number 2	**Academic year:** 2019-2020 (2012 E.C.)
Phone: *+251924230052*	**Semester**: II
Email: *kgoudar@wu.edu.et*	**Class Schedule:** Monday and Friday
Office hours: *Tuesday 9.00 – 11.00 AM*	**Venue:** Room -
Target Group:- *2nd Year Second Semester*	**Course Category: Compulsory /Core**
Pre-request: *Biol2031*	

1. Course Description:

The course deals with the evolutionary development and sequential phylogenetic link that exists between the various groups of vertebrates. Morphological and physiological characteristics and adaptations and geographical locations of each vertebrate class will be covered in adequate detail. The major vertebrate species of Ethiopia will be overviewed with more emphasis on the endemic mammals. The lecture component is reinforced by practicals in which students will study representative live, preserved and/or model specimens of the different vertebrate groups and other relevant audiovisual materials.

2. Course Objective:

After completing the course the student will be able to:

1. Identify the various vertebrate classes and cite examples of individual species that belong to them
2. Describe the evolutionary relationship of vertebrates by integrating knowledge in comparative anatomy and physiology
3. Show the geographical distribution of at least the most common vertebrates
4. Describe the diversity of Ethiopian vertebrate fauna

3. Student work load

Activity breakdown	Lecture	Lab. Sessions	Lab. report	Assignment	Independent Reading	Total
Hours	48	48	25	30	38	189

4. TENTATIVE COURSE SCHEDULE

Week	Conceptual focus (content)	Readings/Assignments
01-03	**1. Introduction** (8 hrs) 1.1. What are chordates? 1.2. The Geologic time table accompanying events in vertebrate evolution 1.3. The fossil record 1.4. Discuss body morphology, physiology, habitat and classification of lower chordates 1.4.1. Hemichordates 1.4.2. Urochordates 1.4.3. Cephalochordates 1.5. Possible invertebrate ancestors of chordates **Test I=10%**	Hikman *et al* (2004) pp.460-477) Pough *et al* (1999) pp.1-147
04-07	**2. The Vertebrates** (8 hrs) 2.1. Definition 2.2. The first vertebrates – **Agnathans** 2.2.1 ***Ostracoderms***(brief description and classification) 2.2.2. ***Cyclostomes***-- Living agnathans (detailed discussion of lampreys and brief account on hagfishes) 2.3. **Gnathostomes** - Jawed vertebrates 2.3.1. The origin of jaws and paired fins (brief account) 2.3.2. Types of caudal fins, scales, jaw suspension, dentition and vertebral articulation in the different gnathostomes. 2.3.3. The first Gnathostomes - **Placoderms** (brief group description and examples). **3. Advanced fishes- Chondrichthes** and **Osteichthyes** (8hrs) 3.1**. Class Chondrichthyes** (cartilaginous fishes) 3.1.1. ***Sub class Elasmobranches*** (discuss detailed morphology, physiology and habitat by taking sharks as an example. Also cover portions of classification	Hikman *et al* (2004) pp.477-497
	3.1.2. ***Subclass Holocephali*** (brief Description of ratfish) **Test II=10%** **3.2. Class Osteichthyes** (Bony Fishes) 3.2.1. Classification of the group (give examples and some description on group characteristics of each) 3.2.2. Detailed coverage of morphology, physiology and habitats of a representative teleost	Hikman *et al* (2004) pp.493-513

08-11	**4. Land Vertebrates**- Tetrapods (7 hrs) 4.1. Origin of Tetrapods and their fish ancestors 4.2. **Class Amphibia** 4.2.1. brief evolutionary history 4.2.2. classification of living Amphibians- Lissamphibiain 4.2.3. The life of amphibians (discuss morphology, physiology, and geographical distribution of anurans and urodels by taking representative examples	Hikman *et al* (2004) pp.515-533
12-15	**5. Amniotes** (10 hrs) 5.1. Origin of amniotic egg and its structure 5.2. **Class Reptilia** (the first amniotes) 5.2.1. Brief evolutionary origin 5.2.2. Classification (Anapsida, Lepidosauria, Archosauria) 5.2.3. Discuss general physiology and morphology of the various reptilian subclasses 5.2.4. Extinction of dinosaurs(discuss prevailing theory)	Hikman *et al* (2004) pp.519-533
	5.3. Class Aves 5.3.1. The origin of feather and flight 5.3.2. General physiology and morphology of birds with emphasis on adaptations to flight 5.3.3. Classifications of birds (Including major avian orders)	Hikman *et al* (2004) pp.534-554
	5.4. Class Mammalia 5.4.1. Evolutionary history of their origin 5.4.2. Unique features of mammals (hair, mammary glands, 3middle ear bones, unique jaw articulation, heterodont dentition, placenta, etc...) 5.4.3. Classification-egg laying mammals, marsupials (pouched mammals), placental mammals. Briefly describe all the orders of placental mammals	Hikman *et al* (2004) pp.555-610
16	**6. Vertebrates of Ethiopia** (3 hrs) 6.1. Vertebrate of diversity of Ethiopia 6.2. Endemic large mammals of Ethiopia and their status **Final Exam =50%**	Internet materials

Practical Content:

Session 1. Protochordates (lower chordates)
Session 2. Agnathans (Ostracoderms and Cyclostomes)
Session 3. Placoderms and Chondrichthyes
Session 4. Osteichthyes
Session 5. Amphibians
Session 6. Reptiles
Session 7. Birds
Session 8. Mammals

5. Teaching Learning Methods:

Lectures, practical sessions, individual or group projects, classes, demonstrations, group work and self directed assignment.

6. Mode of Assessment:

1. Tests_____ 20 %
2. Lab exercise and report_____ 25%
3. Assignments _____ 5%
4. Final exam (including lab activities)_____ 50%
5. Total_____100%

7. Reference Materials

1. Alexander, R. M. (1981). The Chorodates. Cambridge University Press, London.
2. Hickman, C. P., Robert L. S. and Larson, A. (1996). Integrated Principles of Zoology. (10th ed.) Mosby - Year Book, Inc. St. Louis.
3. McFarland, W. N., Pough, F. H., Cade, T. J. and Heiser, J. B. (1979). Vertebrate Life. Macmilan Publishing, New York.
4. Pough, F.H., Janis, C.M. and Heiser, J.B., (1999). Vertebrate Life. (5th ed.) Prentice Hall.
5. Prasad, S. N. (1991). A Text book of Vertebrate Zoology. (13th ed.) Wiley Eastern Limited, New Delhi.
3. Young, J.Z. (1981). The Life of Vertebrates. (3rd ed.). Oxford University Press, New York

Checked by	**Approved by**
Name: Dr. K. S. Goudar	**Name: Dr. Moges Kibret**
Signature: _____	**Signature: _____**