



**Department of .....Biology.....**

**College of .....Science.....**

**University of .....Salahaddin....**

**Subject: .....Chordata & Comparative anatomy.**

**Course Book – (Year 4)**

**Lecturer's name; (Assist. Prof. Sarbaz I. Mohammed, PhD)**

**Academic Year: 2021/2022**



**11. Course objective:**

**Terminology, Classification of vertebrate, evolution, phylogeny of chordate, anatomy of Chordata, homologous structure, heterologous structure.**

- **Classification of subphylum vertebrata (class Myxini, Cephalaspidomorphi, Chondrichthyes, Osteichthyes, amphibian, reptilian, Aves and mammals)**
- **Relationship among fishes, amphibian, reptilian, Aves and mammals**
- **Compression & phylogeny integumentary system, Digestive sys. Circulatory sys. Nervous sys. Skeletal sys (vertebrate, sternum, pectoral & pelvic girdle, skull). Muscular sys. Excretory sys and endocrine sys. among Chordata.**

**12. Student's obligation**

**Classroom polices:**

**1- Attendance:** You are strongly encouraged to attend class on a regular basis, as participation is important to your understanding of the material. This is your opportunity to ask questions. **You are responsible for obtaining any information you miss due to absence**

**2- Lateness:** Lateness to class is disruptive

**3-Talking:** During class please refrain from side conversations. These can be disruptive to your fellow students and your professor

**13. Forms of teaching**

Course Book, white board and PowerPoint

**14. Assessment scheme**

Breakdown of overall assessment and examination

Component	Date	Percent
Exam1	--/--/2021	15 %
Exam 2	--/--/2021	15 %
Respecting Classroom Policy		%
Total		15% T +35%P

**15. Student learning outcome:**

After completion of this course, you will be able to:

- Define common terms used in classification and the structure of chordata.
- Identify all the possible methods for preparation of samples

- Different structure and shape of animals
- Identify basic classification of vertebrate
- Anatomical comparison among classes
- Study Relation of structure to morphology
- General characters of different classes
- Structure and functional evolution among vertebrate.

**16. Course Reading List and References:**

1. Diogo R. and Virginia A. (2010) Muscles of Vertebrates. CRC Press Taylor & Francis Group an informa business.
2. Kardong K.V. (2008) Vertebrates comparative anatomy, function and evolution. 5<sup>th</sup> edit. McGraw-Hill.
3. Gerardo De Iuliis (2007). The Dissection of Vertebrates. Academic Press is an imprint of Elsevier.
4. Phillip E. Pack (2001) Cliffs AP<sup>a</sup> Biology, 2nd Edition. Hungry Minds, Inc.

**17. The Topics:**

**Lecturer's name**

1- The phylum chordata; vertebrate ancestry; kinds of vertebrates.	Week 1
	Week 2
2- The protochordata (body wall. All body organs)	Week 3
3- Types of vertebrates (class; cyclostomata)	Week 4
4- Class chondrichthyes	Week 5
5- Class osteichthyes (teleostomi)	Week 6
6- Class; amphibian	Week 7
7- Class; Reptilia	Week 8
8- Class; Aves	Week 9
9- Class; Mamalia	Week 10
10- Examination 1	Week 11
11- Evolution	Week 12
12- Evolution	Week 13
13- Comparative anatomy of integumentary sys.	Week 14
14- Comparative anatomy of skin derivatives sys	Week 15
15- Comparative anatomy of digestive sys	Week 16
16- Comparative anatomy of muscular sys	Week 17
17- Comparative anatomy of nerve sys	Week 18
18- Examination 2	Week 19
19- Comparative anatomy of cranial nerve sys	Week 20
20- Comparative anatomy of circulatory sys	Week 21
21- Comparative anatomy of endoskeleton sys	Week 22
22- Comparative anatomy of axial skeleton sys	Week 23
23- Comparative anatomy of sternum & ribs sys	Week 24
24- Comparative anatomy of (appendicular skeleton) pectoral girdle sys	Week 25

25- Comparative anatomy of pelvic girdle sys 26- Examination 3 27- Comparative anatomy of skull sys 28- Comparative anatomy of excretory sys 29- Comparative anatomy of respiratory sys 30- Comparative anatomy of sense organ 31- Comparative anatomy of endocrine sys 32- Comparative anatomy of urogenital sys 33- Examination 4	Week 26 Week 27 Week 28 Week 29 Week 30 Week 31 Week 32 Week 33 Week 34
<b>18. Practical Topics (If there is any)</b>	
In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the lecture	Lecturer's name ex: (2 hrs)  ex: 14/10/2021
<b>19. Examinations:</b>	
<p><b>Q1/ Fill the following blanks with suitable answer (15 Marks).</b></p> <ol style="list-style-type: none"> <li>1- The complexity of digestive system depends on the -----, -----, -----.</li> <li>2- The buccopharyngeal cavity in reptiles is divided into two passages by means of ----- to ventral ----- passages and dorsal ----- passages.</li> <li>3- Myomeres are divided into ventral ----- &amp; dorsal ----- masses by a ----- that extends along the transverse processes of the vertebrae.</li> <li>4- Hooves are composed of ventral plate called -----, and dorsal plate -----, attached to the bone by -----.</li> <li>5- Most galliformes are ----- bodied with thick ----- and moderately long -----, and have rounded and Concave -----.</li> <li>6- Penguins drink salt water because their ----- gland filters excess salt from the -----.</li> <li>7- In fish, the lateral septum senses ----- and low ----- and ----- direction flow.</li> <li>8- ----- is genetic change in a population of organisms over time, that produced by -----.</li> <li>9- Character that was possessed by the common ancestor of the species on a branch of an evolutionary tree is called-----</li> </ol> <p><b>Q2/ Answer by true (T) or false (F) (14 Marks).</b></p> <ol style="list-style-type: none"> <li>1- The lizard's right kidneys are positioned farther front than the left.</li> <li>2- Omasum is a true stomach represents 8 % of stomach, has typical enzyme activity.</li> <li>3- Origin of muscles is a proximal site of attachment that is rarely fixed.</li> <li>4- Rabbit has two pairs of upper and one pair of lower incisors.</li> <li>5- Lizards have lost the lower temporal opening or both in snakes.</li> <li>6- The volume of extrinsic muscle is relatively large in posterior limbs than fore limbs because of greater leverage required for locomotion.</li> <li>7- Enamel of teeth is epidermal in origin.</li> </ol>	

- 8- Skin pigmentation in bird due to presence of chromatophores.
- 9- Forelimbs in chelonia with 2<sup>nd</sup> to 5<sup>th</sup> digits long, supporting thin membrane.
- 10- In skates teeth usually flattened and fuse to form pavement for crushing food.
- 11- In bony fish sounds are transmitted through the soft tissue to the inner ear.
- 12- Digestive systems in jawless fish without stomach.
- 13- Natural selection proposed by Lamark
- 14- Monophyletic mean species derived from on ancestor

**Q3/ Explain (12 marks).**

- 1- Difference between invertebrate and vertebrate nervous systems?
- 2- Difference between amphibian's epidermis and reptile's outer epidermis?
- 3- Reptile kidneys are produce less concentrated liquid urine. Why?
- 4- Difference between lower and higher vertebrate's spinal nerves.

**Q4/ Draw and label (9 marks)**

- 1- Draw and label the *Ciona* sp.
- 2- Draw and label the cross section of axial muscles in tetrapodes.
- 3- Draw and label the contour feather.

**20. Extra notes:**

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.

**21. Peer review**

**پیداچونہوہی ھاوہل**

This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.

*(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).*

ئہم کورسبوو کہ دەبیت لەلایەن ھاوہلئیکى ئەکادیمیەوہ سەیر بکریت و ناوەرۆکی بابەتەکانی کورسەکه پەسەند بکات و جەند ووشەیک بنووسیت لەسەر شیاوی ناوەرۆکی کورسەکه و واژووی لەسەر بکات.  
ھاوہل ئەو کەسەیه که زانیاری ھەبیت لەسەر کورسەکه و دەبیت پلەى زانستی له ماموستا کەمتر نەبیت.

Theory Lecturer's

Assist. Prof. Sarbaz I. Mohammed