

Ministry of Higher Education and Scientific research



Department of Biology

College of Education

Salahaddin University

**Subject: Practical Comparative Anatomy of
Chordates**

Course Book – (Year: ٤)

Lecturer's name: Hewa Mohammad Ali-MSc.

Academic Year: ٢٠١٥/٢٠١٦

Course Book

١. Course name	Practical Comparative Anatomy Of Chordates
٢. Lecturer in charge	Hewa Mohammad Ali
٣. Department/ College	Biology Dept./ College of Education
٤. Contact	e-mail: Hewa.ali@su.edu.krd
٥. Time (in hours) per week	Practical: ١٥ hrs
٦. Office hours	٢ hrs
٧. Course code	
٨. Teacher's academic profile	I graduated from the Salahaddin University, college of Education, Department of Biology in ٢٠٠٦ and a bachelor's degree BSc in Biology. After that, I accessed to work at the Ministry of Education till ٢٠٠٧-٢٠٠٩. After that in ٢٠٠٩-٢٠١١ works assistant Biology in Education College of Biology Department. The work was teaching practical Biology such as zoology and Comparative Anatomy in the laboratories. In then started to study MSc in Comparative Anatomy in ٢٠١١-٢٠١٤ at faculty science, Helwan University/Egypt. After finishing my MSc study I worked in my department as an assistant lecture. The teaching practical Comparative Anatomy of Chordates.
٩. Keywords	Homologous, Analogous, Agnatha, Gnathostomata, pices, tetrapoda.
١٠. Course overview:	<p>Comparative anatomy deals with anatomy of vertebrate animals, in particular, and the significance these organisms and their structure may hold. Comparison of structures throws similarities and differences into better relief. Comparative anatomy means comparative study among Classes by taking a number of models for each class. Compared the systems include skeletal , muscular , digestive and other important organs of the body, as well as comparison the external anatomical parts of the structure and function of different parts of different chordate animals, and then you can determine the</p>

position of this group or this animal in ecosystem or in the past. Comparative anatomy of chordates, which are similarities and differences in structural organization and functional morphology of the bodies of different animals. Comparative anatomy may be used to explain some of the phenomena that appear during embryonic development. Knowledge of structure alone has very little meaning unless it is interpreted in terms of function. Morphology and physiology complement each other.

۱۱. Course objective:

Comparative anatomy may be used to explain some of the phenomena that appear during embryonic development. The laboratory component will focus on dissection of bony fish, shark, frog, snake and crocodiles. Knowledge of structure alone has very little meaning unless it is interpreted in terms of function. Morphology and physiology complement each other.

- ۱- Distinguish between major groups of chordates through a demonstrated understanding of their taxonomic classification and diversity.
- ۲- Describe the distinguishing characteristics of all major groups of fishes.
- ۳- Describe distinguishing characteristics of major Ectotherms, Amphibians and Reptiles.
- ۴- Describe distinguishing characteristics of major groups of birds
- ۵- Differentiate all major groups of Mammals.
- ۶- Describe structure of organ systems of vertebrates.
- ۷- Distinguish between the three subphyla of the phylum Chordata through a demonstrated understanding of their taxonomic classification and diversity.

۱۲. Student's obligation

The student attendance in Laboratory three hours a week, preparation of the home works examinations and discussion in the laboratory between Agnatha and Gnathostomata-bonyfish and shark- amphibian and reptiles- aves and mammals.

۱۳. Forms of teaching

- Data show projectors .
- White boards and erasable markers
- Sample and (Histological slides).

١٤. Assessment scheme

Exam questions will be short answer questions such as; identification of slides, location, drawing and table, classify, definition of some topics...etc

Exams	٨٠%
Report	٥%
quizzes	١٠%
Home works assignment	٥%

١٠٠%

١٥. Student learning outcome:

On completion of this course:

Identify significant by external anatomy structures such as, skin in amphibians thin and moist smooth and have glands but skin in reptiles thick hard dry and no glands.

Respiration between class amphibians, reptiles, aves and mammals.

Fertilization between class amphibians, reptiles, aves and mammals.

Eggs: amphibian no shell but reptiles and aves have hard shell.

Metamorphosis: amphibians have metamorphosis but reptiles and aves mammals no metamorphosis.

Claws: the class of amphibians no claws but reptiles and aves have claws on feet web.

Nostiles have paired in group Gnathostomata but single in group Agnatha.

Identify portion of label part and draw the pictures in any class of chordates.

١٦. Course Reading List and References:

Key references:

١. Hickman, C, Hickman, C and Kats L. ٢٠٠١. Integrated principles of Zoology. McGraw-Hill Company.


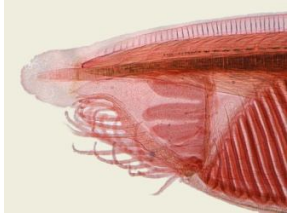
٢. Hopper, A. ١٩٨٥. Foundation of animal development. ٢nd Edition. Oxford Univ.Press.

٣. Kardong, Kenneth V. ٢٠٠٨. Vertebrates: Comparative Anatomy, Function, Evolution. ٥th Edition. McGraw-Hill.

٤. Kenneth V. Kardong. ٢٠٠٦. Vertebrates: Comparative Anatomy, Function, Evolution. ٤th Edition. McGraw-Hill.

٥. Osmond P. Breland. ١٩٥٣. Manual of Comparative Anatomy. ٢nd Edition. McGraw-Hill.

١٧. The Topics:	Lecturer's name
١٨. Practical Topics (If there is any)	
١-Characterize Phylum Chordata	Hewa Mohammad Lab. ١ (٣ hrs)
٢-classification phylum chordates (subphylum: cephalochordate and urochordata)	Lab. ٢
٣-general characteristic of subphylum: vertebrata Group agnatha lamprey and hagfish.	Lab. ٣
٤-general characteristic of Gnathostomata Superclass :pisces , class: chondrichthyes eg. Shark, skate and rate.	Lab. ٤
٥-class: osteichthyes e.g bony fish	Lab. ٥
٦- General characteristics superclass tetrapoda Class: amphibian	Lab. ٦
٧-class: reptiles	Lab. ٧
٨-class: Aves	Lab. ٨
٩-class: Mammals	Lab. ٩
١٠-integment (skin and scales): skin, cyclostomata eg. Lamprey and hagfish.	Lab. ١٠
١١-integmentary system in class: ostichthyes, amphibian, reptilian, and aves.	Lab. ١١
١٢-integmentary system in class mammals.	Lab. ١٢
١٣-compare between teeth in class mammals.	Lab. ١٣
١٤-skeletal system skull in class: chondrichthyes	Lab. ١٤
١٥-Skull in class: Osteichthyes.	Lab. ١٥
١٦-skull in class: amphibian, reptilian,	Lab. ١٦
١٧-skull in class: aves and mammals.	Lab. ١٧
١٨-digestive system of agnatha eg. Lamprey and hagfish.	Lab. ١٨ Lab. ١٩
١٩- digestive system of shark and bony fish.	Lab. ٢٠
٢٠- digestive system of amphibian, reptiles.	Lab. ٢١
٢١- digestive system of aves and mammals.	Lab. ٢٢
٢٢-circulatory system heart of groups agnatha and gnathostomata.	Lab. ٢٣
٢٣-respiratory system: in groups agnatha and gnathostomata.	Lab. ٢٤

<p>٢٤-reproduction system in groups agnatha and gnathostomata. ٢٥-cranial nerves in superclass: pisces and tetrapoda.</p>	<p>Lab. ٢٥</p>
<p>١٩. Examinations:</p> <p>١-what are the differences between two eggs?</p> <div data-bbox="236 533 805 743"></div> <p>--١-lack shell(class: amphibians) --٢-have hard shell (class: reptiles, aves)</p> <p>٢- Identify the slide?</p> <div data-bbox="236 875 523 1086"></div> <p>--Amphioxus.</p> <p>٢. True or false type of exams:</p> <p>١-frog in the order urodela. ---false (anura)</p> <p>٢- salamander in class of amphibian. ---true.</p> <p>٣-mouth of bony fish subterminal. --true</p> <p>٤-shark have large operculaum. --false (no operculum)</p> <p>٣. Multiple choices:</p> <p>١-type of caudal fin in bony fish.(A-heterocercal, B-Homocercal, no caudal fin) --B</p> <p>٢-Eyelids immovable (human, bony fish, shark, frog, snake) --snake</p>	

٢٠. Extra notes:

٢١. Peer review پند اچوونه وهى

HEWA MOHAMMAD ALI