Functional Vertebrate Anatomy (ZOO 3713C), Spring 2017

Lectures: Monday, Wednesday, Friday, 11.45am – 12.35pm (period 5)

Location: Psychology, Rm 0130

Laboratories:

Section 11C9 Monday 1.55 - 6.00 pm (periods 7-10)
Section 11HE Tuesday 1.55 - 6.00 pm (periods 7-10)
Section 11HG Tuesday 8.30 – 11.45am (periods 2 – 5)
Section 21H3 Tuesday 6.15 – 10.10pm (periods 11-E3)
Section 11DD Wednesday 1.55 - 6.00 pm (periods 7-10)

Location: Rm109 Carr Hall (Biology Department)

Course Description and Objectives:
A thorough understanding of Vertebrate anatomy is essential for appreciation of many fields of biology, including whole organism biology, molecular and cellular biology, paleontology, evolutionary development, biomechanics, sports therapy, medicine and veterinary medicine. This course presents a functional perspective of comparative vertebrate anatomy, taking advantage of both the diversity and conservation of morphological structure in the animal kingdom to increase appreciation for how form can dictate function of select organ systems and of the organism as a whole. Form is studied not only at the anatomical level but also at the cellular and molecular level as well as at the developmental level as these are the basic building blocks on which anatomy is moulded. The organisms studied are the Chordates which range from Tunicates to Mammals.

Three-weekly lectures and the once-weekly laboratories are intended to be mostly co-ordinated such that the laboratory work solidifies and expands upon what is discussed in the lectures and reinforces anatomical terminology, structure and form. The systems covered include all the major components of the vertebrate body and the understanding of these systems is achieved by lectures, dissection, examinations of prepared tissues, histological studies and practical work.

Course requirements: Consistent and punctual attendance to all parts of the course is expected and required and a component of the marks is specifically laid aside for this. There will be a total of three non-cumulative examinations on the lecture material spaced out during the course with the third examination during finals week and these examinations will be multiple choice. There are also several quizzes during the laboratory periods which all contribute towards the final grade as well as two lab exams. There is also a short essay required on a topic of contemporary interest in biology.

Instructor:
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Teaching Assistants:

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Required Texts (lectures):

Functional Anatomy of the Vertebrates: An Evolutionary Perspective
by K.F. Liem, W.E. Bemis, W.F. Walker and L. Grande, 3rd Edition, Brooks Cole, 2001.

Required Texts (labs):

Kardong, K.V. and Zalisko, E.J. *Comparative Vertebrate Anatomy – A laboratory dissection guide* 7th Edition. 2014.

Lectures, Handouts and Supplemental Readings:

Lectures will be posted on the course Canvas site at least the day before class and it is expected that you will either print the appropriate handouts and bring them to class with you or follow them on Canvas and they will be available there for revision. Papers for the essay will be posted the previous week.

Handouts and readings for the lab will be posted on the course site. Laboratory handouts will be posted by Thursday of the preceding week. Several pre-lab quizzes will be conducted on the Canvas site.

Examinations and Grading:

Final grades will be determined as a combination of exams, quizzes, attendance at both lecture and lab, and participation in the course. It is very difficult to learn when one is not engaged and actively interacting with one's peers and with the instructors.

Exams 1, 2 and 3 approx 200 each	580
Short essay	100
Lab	280
Attendance (all parts of the course)	40
Total	1000

Final exam date – Thursday 27th April, period 5

LECTURE TOPICS

WEEK	LECTURE	TOPIC	READING (textbook)
1	1	Introduction	Ch 1
	2	Chordates, Craniates & Vertebrates	Ch 2, 3
2	3	Integumentary System I	Ch 6
	4	Integumentary System II	Ch 6
3	5	Development I	Ch 4
	6	Development II	Ch 4
	7	Evolution & Development	Ch 4
4	8	Connective tissues	Ch 5
	9	Skeleton, cranial	Ch 7
	10	Skeleton, axial	Ch 8
5	11	Skeleton, appendicular	Ch 9
	12	Evolution of limbs - the fin to limb transition	Ch 9
		Revision session	
6		**EXAM I** (in classroom)	
	13	Muscle structure, skeletal	Ch 10
	14	Muscle structure, cardiac, smooth, evolution of axial muscles	Ch 10
7	15	Evolution of cranial muscles	Ch 10
	16	Digestive I teeth, jaws	Ch16
	17	Digestive system II	Ch 17
8	18	Digestive system III	Ch 17
	19	Respiratory system I	Ch 18
	20	Respiratory system II	Ch 18
9		SPRING BREAK	
10	21	Circulatory system I	Ch 19
	22	Circulatory system II	Ch 19
		Revision session	
11		**EXAM II** (in classroom)	
	23	Excretory system	Ch 20
	24	Osmoregulation	Ch 20
12	25	Reproduction	Ch 21

	26	Reproduction & hormones	Ch 21
	27	Endocrine system I	Ch 15
13	28	Endocrine system II	Ch 15
	29	Development of the nervous system	Ch 13
	30	Cells of the nervous system	Ch 13
14	31	Sensory systems, spinal cord	Ch 13
		Assignment essay discussion	
	32	Sensory systems, cranial nerves	Ch 13
15	33	Sensory systems, eye	Ch 12
	34	Brain evolution	Ch 14
	35	Regeneration of tissues	
16		Revision session	
		Assignment essay due	
		Reading day	
17			
		FINAL EXAM	

LAB TOPICS

MATERIAL COVERED	QUIZ/EXAM
Origin & Evolution of Vertebrates; Integument (Chps. 1 - 4)	
Embryology (special chapter - handout)	**QUIZ**
Cranial Skeletal System (Chp. 5)	
Axial & Appendicular Skeletal System (Chps. 5)	**QUIZ**
Muscular System (Superficial muscles, Chp. 6)	
Muscular System (Deep muscles, Chp. 6)	**QUIZ**
Reviews and **Exam 1***	**EXAM**
Digestive (Chp. 7)	
Respiratory Systems (Chp. 8)	
Circulatory System 1 (Chp. 7)	**QUIZ**

	Circulatory System 2/Urogenital Systems (Chps. 8 & 9)	
	Nervous & Sensory Systems (Chp. 10)	**QUIZ**
	Reviews and **Exam 2***	**EXAM**

REQUIRED TEXTS: Bring to every lab.
Kardong, K.V. and Zalisko, E.J. 2014. Comparative Vertebrate Anatomy – A laboratory dissection guide 7th Edition.

REQUIRED EQUIPMENT:
-Blunt forceps, blunt probe, sharp probe, scissors, scalpel. Lab coats, aprons, andcolored pencils optional.

DISSECTING EQUIPMENT IS NOT SUPPLIED IN LAB.
Gloves are provided.

GRADING: Lab grade is worth approximately 30% of the total course grade.
Exam 1: 100 points
Exam 2: 100 points
Quizzes (5 @ 16 points each): 80 points
Dissection participation: 40 points