Comparative Vertebrate Anatomy
Biol 241
Fall 2017

Time/Location

Monday and Wednesday, 5:00 pm – 6:15 pm, Loyola Science Center 212

Instructors

Dr. Robert Smith
Professor of Biology
Loyola Science Center 252
Email: Robert.Smith@scranton.edu

Office Hours

Monday 11:00 am – 12:00 pm, Tuesday 1:00 – 2:00, Thursday 2:00 pm – 3:00 pm.

The Course

This course is a survey of the major vertebrate groups, emphasizing the evolutionary relationships between these groups. Lectures are designed to provide students with an understanding of vertebrate origins, phylogenetic relationships and the structure/function of selected organ systems.

Desire to Learn:

I incorporate D2L as part of my teaching methodology and will make MS Powerpoint presentations, transparency overheads, etc. available to you using this medium. I will also post grades on D2L.

Field Trip

I have tentatively planned a field trip to the American Museum of Natural History on Saturday, 11 November. I will provide more information as plans finalize.

Student Learning Outcomes

This class will examine the gross structure of vertebrates, allowing students to gain appreciation of the functional, evolutionary, developmental and physiological mechanisms influencing the design of vertebrates. Upon completion of this course, students will/will be able to:

1. Discuss basic evolutionary concepts and principles, including variability, heritability, fitness, natural selection, evolutionary change, adaptation, microevolution, speciation, macroevolution and adaptive radiation.
2. Understand basic phylogenetic systematics.
3. Describe the phylogenetic relationships among the Phylum Chordata and Subphylum Vertebrata, discuss the characteristics unique to each group and demonstrate an understanding of how those characteristics relate to each group's evolution and current natural history.
4. Understand the significance of examining vertebrate form in the context of determining evolutionary relationships.
5. Discuss morphology as it relates to function, especially with respect to the adaptive significance of particular structures and organ systems.
6. Understand how biomechanical constraints influence anatomical and physiological adaptation.
7. Identify and provide a basic description of how major vertebrate systems function.

Required Materials

Textbook: We will be using Kardong, K. 2014. Vertebrates: Comparative Anatomy, Function, Evolution. Seventh Edition, McGraw-Hill. ISBN 978-0078023026.

Student Responsibilities

Students are responsible for all information presented in lecture, along with assigned readings and handouts.

I have no tolerance for cheating. Students are expected to know and follow the University of Scranton policies concerning academic honesty.

Students with Disabilities

Reasonable academic accommodations may be provided to students who submit relevant and current documentation of their disability. Students are encouraged to contact the Center for Teaching and Learning Excellence (CTLE) at disabilityservices@scranton.edu or (570) 941-4038 if they have or think they may have a disability and wish to determine eligibility for any accommodations. For more information, please visit www.scranton.edu/disabilities.

Grading

Lecture: There will be three (3) lecture exams and a lecture final. Each exam, including the final, is worth 100 points. Please note that the final will be comprehensive and all students are required to take the exam.

Grades will be determined by dividing the total points earned by the total points possible and multiplying by 100. The following criteria will be used to assign letter grades:

A = 94 – 100	A- = 90 – 94	B+ = 87 – 89	B = 83 – 86
B- = 80 – 82	C+ = 77 – 79	C = 73 – 76	C- = 70 – 72
D+ = 66 – 69	D = 60 – 65	F = below 60	

There will be no extra credit.

While I am happy to discuss grade-related issues with you I will not respond to emails asking about your grade. If you have grade-related questions please feel free to stop by my office.

Important Dates:

Monday, 25 September	**- Exam #1**
Monday, 23 October	**- Exam #2**
Monday, 20 November	**- Exam #3**
Exam Week	**- Comprehensive Final Exam**

Tentative Schedule

Week of	Topic	Chapter(s)
21 Aug	Evolution and Natural Selection	1
28 Aug	Evolution and Natural Selection, Origin of Chordates	1,2
4 Sept	Origin of chordates, The Vertebrate Story	2, 3
11 Sept	The Vertebrate Story, Vertebrate Development	3,5
18 Sept	Vertebrate Development	5,7
25 Sept	Skeletal System: Skull	7
2 Oct	Skeletal System: Axial Skeleton	8
9 Oct	Skeletal System: Axial Skeleton	8
16 Oct	Skeletal System: Appendicular Skeleton	9
23 Oct	Skeletal System: Appendicular Skeleton	9
30 Oct	Muscles	10
6 Nov	Muscles, Respiratory System	10,11
13 Nov	Respiratory and Circulatory Systems	11,12
20 Nov	Circulatory System	12
27 Nov	Digestive System and Integument Systems	13,6,14
Exam Week	**Final (Comprehensive) Lecture Exam**	

Comparative Vertebrate Anatomy Laboratory
Biol 241L
Fall 2017

Time/Location

Laboratory: Monday, Wednesday from 12:00 – 1:50
(Lecture and Lab are co-requisites and must be taken concurrently)
Loyola Science Center 260

Instructors

Dr. Robert Smith
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Loyola Science Center 252
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Raymond Stemrich
Graduate Teaching Assistant
Loyola Science Center 392
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Office Hours

Monday 11:00 am – 12:00 pm, Tuesday 1:00 – 2:00, Thursday 2:00 pm – 3:00 pm.

The Course

This course is a survey of the major vertebrate groups, emphasizing the evolutionary relationships between these groups. Lectures are designed to provide students with an understanding of vertebrate origins, phylogenetic relationships and the structure/function of selected organ systems. Labs consist of anatomical dissections of the lamprey, dogfish, perch, mudpuppy, turtle, pigeon and cat. Anatomical structures will be identified and their organization interpreted with respect to embryologic development, phylogeny and functional adaptation.

Desire to Learn:

I incorporate D2L as part of my teaching methodology and will make MS Powerpoint presentations, transparency overheads, etc. available to you using this medium. I will also post grades on D2L.

Student Learning Outcomes

This class will examine the gross structure of vertebrates. In combination with the lecture portion of the course (Biol 241), students will gain appreciation of the functional, evolutionary, developmental and physiological mechanisms influencing the design of vertebrates. Upon completion of both the laboratory and lecture sections of this course, students will/will be able to:

1. Discuss basic evolutionary concepts and principles, including variability, heritability, fitness, natural selection, evolutionary change, adaptation, microevolution, speciation, macroevolution and adaptive radiation.
2. Understand basic phylogenetic systematics.
3. Describe the phylogenetic relationships among the Phylum Chordata and Subphylum Vertebrata, discuss the characteristics unique to each group and demonstrate an understanding of how those characteristics relate to each group's evolution and current natural history.
4. Understand the significance of examining vertebrate form in the context of determining evolutionary relationships.
5. Discuss morphology as it relates to function, especially with respect to the adaptive significance of particular structures and organ systems.
6. Understand how biomechanical constraints influence anatomical and physiological adaptation.
7. Know basic anatomical terms and descriptors.
8. Attain proficiency in soft tissue dissection.
9. Identify and provide a basic description of how major vertebrate systems function.

Required Materials

Laboratory Manuals:

Wischnitzer, S. 2006. Atlas and Dissection Guide for Comparative Anatomy. 6th Edition, W.H. Freeman. ISBN 9780716769590.

Dissecting Tools: purchase a lab coat and dissection kits from the Stockroom in the basement of Loyola Science Center. Protective eyewear is also strongly recommended. Vinyl gloves will be provided.

Student Responsibilities

Students are responsible for all information presented in lab, along with assigned readings and handouts.

I have no tolerance for cheating. Students are expected to know and follow the University of Scranton policies concerning academic honesty.

Students are responsible for cleaning up before leaving lab.

Students with Disabilities

Reasonable academic accommodations may be provided to students who submit relevant and current documentation of their disability. Students are encouraged to contact the Center for Teaching and Learning Excellence (CTLE) at disabilityservices@scranton.edu or (570) 941-4038 if they have or think they may have a disability and wish to determine eligibility for any accommodations. For more information, please visit www.scranton.edu/disabilities.

Grading

There will be three (3) laboratory practical exams (approximately 80 pts each) and you will be evaluated on your dissection skills (50 pts). Grades will be determined by dividing the total points earned by the total points possible and multiplying by 100. The following criteria will be used to assign letter grades:

A = 94 – 100	A- = 90 – 93	B+ = 87 – 89	B = 83 – 86
B- = 80 – 82	C+ = 77 – 79	C = 73 – 76	C- = 70 – 72
D+ = 66 – 69	D = 60 – 65	F = below 60	

There are no make-up practical exams and no extra credit.

While I am happy to discuss grade-related issues with you I will not respond to emails asking about your grade. If you have grade-related questions (or wish to discuss anything else) please feel free to stop by my office.

Important Dates:

Monday, 4 September	- Labor Day
Wednesday, 20 September	**- Exam #1 (Amphioxus, lamprey and dogfish)**
Monday, 9 October	- Fall Break
Wednesday, 25 October	**- Exam #2 (perch, mudpuppy and turtle)**
Wednesday, 22 November	- Thanksgiving Break
Wednesday, 29 November	**- Practical #3 (pigeon, cat and human skeleton)**

Tentative Schedule

Date		Subject
21	August	Amphioxus
23	August	Amphioxus, lamprey
28	August	Amphioxus, lamprey
30	August	dogfish
4	September	**Labor Day**
6	September	dogfish
11	September	dogfish
13	September	dogfish/perch
18	September	dogfish/perch
20	September	**Practical I (Amphioxus, lamprey and dogfish)**
25	September	perch
27	September	mudpuppy
2	October	mudpuppy
4	October	mudpuppy/turtle
9	October	Midterm Break
11	October	turtle
16	October	turtle
18	October	turtle
23	October	turtle
25	October	**Practical II (perch, mudpuppy, turtle)**
30	October	pigeon
1	November	pigeon
6	November	pigeon
8	November	cat external, cat and human Skeleton
13	November	cat, external, cat and human Skeleton
15	November	cat, Internal/Muscles
20	November	Lab – cat, internal/muscles
22	November	Thanksgiving Break
27	November	cat, internal/muscles
29	November	**Lab Practical III (pigeon and cat plus human skeleton)**