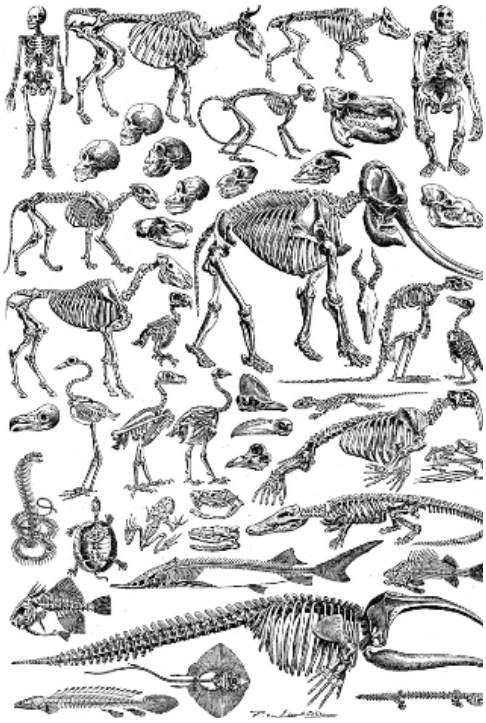
BIO 317
Comparative Vertebrate Anatomy & Physiology
Spring 2016; TR 9:25-10:40; 300 Cox Science & Language



Professor: Dr. Nicholas A. Pullen
Office Hours: **MW** (9-11:30am), **R** (2-5pm), and by appointment
Office Location: Cox Science & Language 205
Office Telephone: (573) 592-1143
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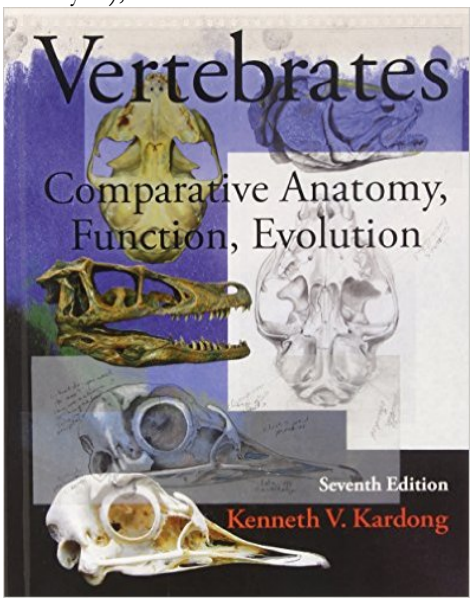
WWU Mission: An independent voice in higher education, William Woods University distinguishes itself as a student-centered and professions-oriented university committed to the values of ethics, self-liberation, and lifelong education of students in the world community.

Course Description: This course is a study on the diversity and connectivity of the subphylum *Vertebrata*. Participants will examine the form and function of anatomical structures from various species and integrate this knowledge with natural history to deduce the evolutionary relationships among the vertebrates – how/why they adapted to particular environments. Cellular and physiological parameters among vertebrates and some non-vertebrates will be compared. Additionally, discrete knowledge and practice of anatomical/physiological terminology and structural identification will be gained.
2015-2016 Academic Catalog: https://www.williamwoods.edu/catalogs/1516/undergraduate/index.aspx

Course Prerequisites: BIO 124 (General Biology II) and CHM 124 (General Chemistry II); current enrollment in BIO 318



Required Text: Kardong, Kenneth V. *Vertebrates: Comparative Anatomy, Function, Evolution*. 7th ed. McGraw Hill, 2014.

Other Resources:
Smithsonian, Dept. of Vertebrate Zoology (http://vertebrates.si.edu/index.html) Maintains *Wilson & Reeder's Mammal Species of the World* database (also found through Dr. Reeder's websites at Bucknell.edu).
American Museum of Natural History, Div. of Vertebrate Zoology (http://research.amnh.org/vz/)

Technology Use Expectations: Messages via WWU email are official communication; students are responsible for regularly checking their WWU email accounts. Students are expected to become familiar with basic literature searches using internet databases. Course documents, and grades will be available on the relevant Owlnet page(s). Technology issues should be directed to UIT (ext. 4224; helpdesk@williamwoods.edu).

Course Objectives:
With satisfactory completion of BIO317, students will:
1. Gain knowledge of anatomical & physiological terminology.
2. Compare anatomical & physiological properties/characteristics across vertebrate species in an evolutionary context.
3. Model the development of vertebrates.
4. Develop comfort and skill with oral and written scientific communication.

Biology Program Objectives:

1. Demonstrate knowledge of cell ultra-structure and basic cellular processes and develop an understanding of the requisites of life.
2. Converse with the basic tenets of transmission, molecular, developmental and population genetics.
3. Contributes to an overview of the major organ systems of the human body and the normal and pathological functioning of those organ systems.
4. Demonstrate knowledge of the diversity and taxonomy of organisms, and the significance of variation in morphology, behavior, and life history.
5. Explain the role that natural selection, genetic drift, and other phenomena have had on the production of biological diversity and the role evolution has in integrating explanations of both the unity and diversity of life.
6. Demonstrate knowledge of scientific methodologies and usage of current scientific equipment and technologies.

Assessment Procedures and Course Assignment Details: Grades are earned through the completion of scheduled unit exams and quizzes, a research paper, and a final exam.

Information addressing all of the above objectives is presented through assigned text & case readings, literature research, PowerPoint presentations, videos, and seminar-style discussions. Formative assessment of student achievement in all objectives is performed via class discussions and quizzes. Summative assessment is performed with unit exams, a comprehensive final exam, and a research paper. *Data pertaining to Biology Program Objective 3 are used for B.A. and B.S. annual Biology Assessment Plans.*

Unit Exams: Taken during scheduled course meeting times. They will be cumulative where necessary. Exams consist of multiple choice, modeling problems, short and long essays, and may cover assigned reading material not directly discussed in class meetings. *Make-up exams are offered only in consideration of extraordinary circumstances.* In the case of absence from an exam because of a University-sponsored activity, the student should arrange a time to take the exam beforehand.

Final Exam: A final, summative exam will be given **Thursday, May 5, starting at 9:25AM**. Make-up final exams cannot be arranged. Absence will result in a score of 0.

Quizzes: Generally cover material since the last quiz or exam, some questions will come from assigned reading that week not yet discussed in class. **Make-up quizzes are not offered.**

Paper: Students will write a 5-page paper (double-spaced, 12-pt. font max., 1" margins max.) presenting a comparative analysis of a specific anatomical structure or physiological process. The chosen topic must be specific, comparable across at least 3 taxonomic groups, and approved by Dr. Pullen. A minimum of 5 peer-reviewed references is required. Figures and references do not contribute toward length; figures are encouraged for analytical support. **This is due Thursday, April 28 by 9:25AM.**

Tutoring Information for ALL Students:

- **Writing**: Kemper 216
  Contact Dr. Greg Smith for questions: greg.smith@williamwoods.edu
- **Math:** Science and Language 313
  Contact Professor Raymond Hune for questions: raymond.hune@williamwoods.edu

- **SmartThinking**
  Online assistance for English, Math, and most other academic subjects is also available 24/7 through Smarthinking, our e-tutoring service provider. Just click on the "Tutoring" tab at the top of your OWLNet main page and follow the simple directions to connect with a dedicated personal tutor!

  No separate login is required. You will see a list of basic subjects, and a field to do a subject search. For most subjects there are two options, "Drop-in tutoring" and "Offline questions." Drop-in allows you to chat live with a tutor, and offline allows you to submit a question and they email you back the answers.
  Please contact the Academic Advising Office at bonnie.carr@williamwoods.edu if you need additional assistance.

- **Atomic learning**
  All students at WWU have access to this online tutorial program. Atomic Learning is a digital tutorial website with more than 1,500 hours of online professional development and learning resources. This program will assist you in learning how to use different software programs.

  Atomic Learning is accessed through Owlnet. Once logged into Owlnet, the Atomic Learning link is on the far right in the grey section under courses. The log in is your email user name and password. If you have any questions or concerns you can contact the UIT helpdesk at helpdesk@williamwoods.edu.

Grading Scale:

- Percentages from lecture and lab (BIO318) will be combined into one final grade.
- Lecture is weighted as ¾ of the final grade and lab as ¼.
- Passing final grades must be received in lecture and lab to pass both courses.

Available Lecture Points:

Activity	*Category Total Point Value*
Unit Exams (x3)	300
Final Exam	150
Quizzes (x8)	80
Comparative Paper	70
Semester Total	**600**

Final letter grades are based on the percentage of points earned:

Letter Grade Ranges

%Points Earned	*Letter*
<60%	F
≥60%, <70%	D
≥70%, <80%	C
≥80%, <90%	B
≥90%	A

Attendance Policy: Attendance at every class meeting is expected.

Class Conduct and Participation Expectations: Students are expected to work hard, ask questions, and discuss relevant information. Much learning is borne out of open-ended discussions on anatomy & physiology. All participants are expected to be respectful of others.

Policy on Late Work: Late work is not accepted for this course.

ADA Guidelines:

- Students who choose to disclose a disability are responsible for notifying the University of their disability on a timely basis. Questions about disability services should be directed to the University's coordinator for disability services. Contact information is (573) 592-1194 or ada@williamwoods.edu. The office is on the first floor of the Academic Building.

Academic Integrity Policy

- William Woods University, founded on the principle of honesty, has long endeavored to maintain an atmosphere of academic integrity. In all academic work, it is important that the ideas and contributions of others be appropriately acknowledged, and that work that is presented as original is, in fact, original. Insuring the honesty and fairness of the intellectual environment at William Woods University is a responsibility that is shared by the entire campus community. Details of the Academic Integrity Policy can be found at the following web address:
  https://www.williamwoods.edu/catalogs/1516/undergraduate/policy_detail.aspx?Policies_id=51

Student Outcomes Assessment Policy: 2015-2016 Academic Catalog
https://www.williamwoods.edu/catalogs/1516/undergraduate/policy_detail.aspx?Policies_id=30

Additional Academic Policies can be found at: 2015-2016 Academic Catalog: https://www.williamwoods.edu/catalogs/1516/undergraduate/policies.aspx

Academic Credit Hour Definition: The University has adopted the following United States Department of Education definition of a credit hour:

A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than:

(1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time.

Expected Outside Time Commitment: Following the US DOE definition, students should expect to spend a minimum of 90h outside time for the lecture component (BIO317) since it is similar in time structure to a 3-credit course. Estimated time is given by activity in the course schedule table (next page).

Add/Drop Deadlines and Other Important Dates:

- Last day to add a class – January 15, 4:30 PM.
- MLK Day (no classes) – January 18
- Last day to drop a class during refund period – February 8, 4:30 PM
- Student Performance Reviews (no classes) – February 16 & 17
- End of Midterm – March 4
- Midterm grades reported – March 8
- Daylight Saving Time begins – March 13
- Last day to drop a class or withdraw from the University – March 21, 4:30 PM
- Spring Break (no classes) – March 28-April 1
- Finals Week – May 2-6

TENTATIVE COURSE SCHEDULE

Topics may change and will be announced in class.
Reading numbers correspond to Kardong Chapters.

Dates	Topics	Reading (time required)	Assignment (time required)
12-14 Jan	Introduction and Origin of Chordates	1, 2 (5h)	
19-21 Jan	Origin of Chordates and Vertebrates	2, 3 (2.5h)	Quiz (1h)
26-28 Jan	Vertebrate Evolution, Form and Function	3, 4 (2.5h)	Quiz (1h)
2-4 Feb	Biophysics (including mechanics) and Review	4	**EXAM 1, 4 Feb** (10h)
9-11 Feb	Embryology and Development	5 (2.5h)	
18 Feb	**No Class 16 Feb**, Integument	6, (2.5h)	Quiz (1h)
23-25 Feb	Skull and Axial Skeleton	7, 8(5h)	Quiz (1h)
1-3 March	Axial Skeleton and Review	8	**EXAM 2, 3 March** (10h)
8-10 March	Appendicular Skeleton	9 (2.5h)	
15-17 March	Muscles and Respiratory System	10, 11 (5h)	Quiz (1h)
22-24 March	Circulatory System	12 (2.5h)	Quiz (1h), A topic for your paper should be approved BEFORE you leave for break (2h).
29-31 March	**Spring Break**		
5-7 April	Digestive System	13 (2.5h)	**EXAM 3, 7 April** (10h)
12-14 April	Urogenital	14 (2.5h)	
19-21 April	Endocrine Organs and Signals	15 (2.5h)	Quiz (1h)
26-28 April	Neuroanatomy and Review	16 (2.5h)	Quiz (1h); paper due 28 April (12h)
5 May	**Thursday 9:25 AM**	1-16	**FINAL EXAM**