

## OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

<b>Course Code and Number:</b> BIO 306		<b>Number of Credits:</b> 4 <a href="#">Course credit policy (105)</a>															
<b>Course Full Title:</b> Vertebrate Organ Systems <b>Course Short Title:</b> <i>(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)</i>																	
<b>Faculty:</b> Faculty of Science		<b>Department (or program if no department):</b> Biology															
<b>Calendar Description:</b> Focuses on the comparative anatomy and physiology of vertebrate organ systems. Organ systems covered in this course include cardiovascular, respiratory, digestive, excretory, reproductive, and lymphatic/immune.																	
<b>Prerequisites (or NONE):</b>		Any three 200-level biology courses. Note: BIO 305 is recommended.															
<b>Corequisites (if applicable, or NONE):</b>																	
<b>Pre/corequisites (if applicable, or NONE):</b>																	
<b>Antirequisite Courses</b> <i>(Cannot be taken for additional credit.)</i> Former course code/number: Cross-listed with: Dual-listed with: Equivalent course(s): <i>(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)</i>		<b>Special Topics</b> <i>(Double-click on boxes to select.)</i> This course is offered with different topics: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <i>(If yes, topic will be recorded when offered.)</i>															
		<b>Independent Study</b> If offered as an Independent Study course, this course may be repeated for further credit: <i>(If yes, topic will be recorded.)</i> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, repeat(s) <input type="checkbox"/> Yes, no limit															
<b>Typical Structure of Instructional Hours</b> <table border="1"> <tr> <td>Lecture/seminar hours</td> <td>45</td> </tr> <tr> <td>Tutorials/workshops</td> <td></td> </tr> <tr> <td>Supervised laboratory hours</td> <td>45</td> </tr> <tr> <td>Experiential (field experience, practicum, internship, etc.)</td> <td></td> </tr> <tr> <td>Supervised online activities</td> <td></td> </tr> <tr> <td>Other contact hours:</td> <td></td> </tr> <tr> <td><b>Total hours</b></td> <td><b>90</b></td> </tr> </table>		Lecture/seminar hours	45	Tutorials/workshops		Supervised laboratory hours	45	Experiential (field experience, practicum, internship, etc.)		Supervised online activities		Other contact hours:		<b>Total hours</b>	<b>90</b>	<b>Transfer Credit</b> Transfer credit already exists: <i>(See <a href="#">bctransferguide.ca</a>.)</i> <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Submit outline for (re)articulation: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <i>(If yes, fill in transfer credit form.)</i>	
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		<b>Grading System</b> <input checked="" type="checkbox"/> Letter Grades <input type="checkbox"/> Credit/No Credit															
		<b>Maximum enrolment (for information only):</b> 24 <b>Expected Frequency of Course Offerings:</b> Every second year <i>(Every semester, Fall only, annually, etc.)</i>															
<b>Department / Program Head or Director:</b> Gregory Schmaltz		<b>Date approved:</b> February 2021															
<b>Faculty Council approval</b>		<b>Date approved:</b> April 30, 2021															
<b>Undergraduate Education Committee (UEC) approval</b>		<b>Date of meeting:</b> November 26, 2021															

Labs to be scheduled independent of lecture hours: ☐ No ☒ Yes

**Learning Outcomes:**

Upon successful completion of this course, students will be able to:

1. Compare and contrast the physiology and anatomy of the circulatory system of vertebrates.
2. Assess the efficiency of the different types of gas exchange organs used in vertebrates.
3. Examine the variety of homeostatic mechanisms seen in vertebrates.
4. Analyze the physiological mechanisms of vertebrate kidneys.
5. Compare the anatomy and physiology of vertebrate digestive systems.
6. Interpret the evolutionary advantages of endothermy vs ectothermy.
7. Contrast the reproductive systems in vertebrates.

**Prior Learning Assessment and Recognition (PLAR)**

☒ Yes ☐ No, PLAR cannot be awarded for this course because

**Typical Instructional Methods** (*Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.*)

Lectures, laboratories, small group discussions, audio-visual presentations.

**NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.**

**Typical Text(s) and Resource Materials** (*If more space is required, download Supplemental Texts and Resource Materials form.*)

Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1. Karel F. Liem, William E. Bemis, Warren F. Walker Jr., Lance Grande	Functional Anatomy of the Vertebrates	<input checked="" type="checkbox"/>	Brooks Cole	2000
2.		<input type="checkbox"/>		

**Required Additional Supplies and Materials** (*Software, hardware, tools, specialized clothing, etc.*)

**Typical Evaluation Methods and Weighting**

Final exam:	35%	Assignments:	%	Field experience:	%	Portfolio:	%
Midterm exam:	25%	Project:	%	Practicum:	%	Oral presentations:	
Quizzes/tests:	10%	Lab work:	30%	Shop work:	%	Total:	100%

**Details (if necessary):**

**Typical Course Content and Topics**

- Integration of physiological systems: review of taxonomy, physiological system overview
- Circulation: anatomical comparisons, heart rate control, peripheral circulation patterns
- Acid/base balance and gas exchange: gas transfer, gills vs lungs, pH in body fluids
- Ionic and osmotic control:
  - Osmoregulation in aquatic and terrestrial organisms
  - Nephron structure/function
  - Ammonotelic, ureotelic, and uricotelic vertebrates
- Digestion and metabolism: feeding, alimentary systems, nutritional requirements
- Immunology of vertebrates: cells of immune system, lymphatic circulation
- Environmental aspects of physiology:
  - Ectothermy, endothermy, body size vs metabolic rate
  - Adaptations to extreme environments
- Reproduction of vertebrates: reproductive strategies

**Laboratory experiments:**

- Computer simulation of mammalian cardiovascular system
- Computer simulation of the effect of drugs and hormones on heart rate and BP in mammals
- Human EKG lab
- Pending availability, dissection of already prepared dogfish specimens and examination of circulatory, digestive, excretory, and reproductive systems
- Pending availability, dissection of already prepared mudpuppy specimens and examination of circulatory, digestive, excretory, and reproductive systems
- Pending availability, dissection of already prepared cat specimens and examination of circulatory, digestive, excretory, and reproductive systems
- Determination of standard metabolic rate