IB 531: Vertebrate Physiology I Winter 2019

Lecture: T, R, 1000-1120   Recitation: R, 1600

Prerequisites: Graduate standing.

Course Credits: This course combines 30 hours of lecture and 10 hours of recitation for 4 credits.

Course Content: Systems/concepts covered include motor reflexes, autonomic nervous system, digestion/metabolism, renal and osmorgulatory, endocrine and reproductive systems. This course may be taken alone or as the first course in the IB 531, IB 532 series.

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Text: Guyton and Hall, Textbook of Medical Physiology n\textsuperscript{th} ed.

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture topic (Text chapters)</th>
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<tr>
<td>Jan 8, 10</td>
<td>Membrane physiology: Transport, communication; membrane potentials and cellular communication (Ch. 4, 5); Muscle physiology: Membrane and action potentials (Ch. 5)</td>
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<td>Jan. 15, 17</td>
<td>Skeletal, smooth muscle contraction (Ch. 5, 6, 7, 8)</td>
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<td>Jan 22, 24</td>
<td>Neuron physiology; Somatic sensory inputs (Ch. 47-48)</td>
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<td>Jan. 29, 31</td>
<td>Sensory inputs: Acoustic, Visual (Ch. 49-52; 55 pp. 692-697)</td>
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In Recitation \(\Rightarrow\) **Exam #1, Thursday, 31 Jan. (50 points) \(\Rightarrow\)**

| Feb 5, 7 | Simple neural circuits, motor control: Spinal reflexes (Ch. 54); Central nervous system integration: Basal nuclei/cerebellar function (Ch. 56) |
| Feb. 12, 14 | Autonomic nervous system; neurotransmitters. |
| Feb. 19, 21 | Control and comparative physiology of digestion, absorption, nutrition. (Ch. 73) |
| Feb. 26, 28 | Kidney structure and nephron physiology (Ch. 26, 27) |

In Recitation \(\Rightarrow\) **Exam #2, Thursday 28 Feb: Neural circuits, Digestion, Kidney (50 pts) \(\Rightarrow\)**

| March 7, 9 | Endocrine control of growth, metabolism, minerals (Ch. 74-79) |
| March 14, 16 | Endocrine control of reproduction (Ch. 80-81) |

March xx \(\Rightarrow\) **Final Exam (xxxx, xx March, xxxx hrs; 100 points; comprehensive) \(\Rightarrow\)**
Paper

Graduate students will be required to write a short paper describing a vertebrate specialization of one of the systems covered (e.g., the pulmonary physiology of high altitude frogs). With this paper, you will demonstrate the ability to conduct an independent review of the primary scientific literature, and summarize the current state of what the scientific community knows, and what we would like to know about this topic.

Exams

Exams will be short answer/essay/fill-in blank, and will test your knowledge and comprehension of physiological systems in the vertebrate body, and to the extent that is covered in class, the variation in those systems among vertebrate taxa. Be advised that some anatomical knowledge will be required to describe the physiological systems.

The grading scale for the course will be no stricter than 90-100% A- or better, 80-90% B- or better, 70-80% C- or better, 60-70% D- or better, 0 - 60% F. This grading scale may be relaxed, based on my perception of the relative difficulty of the exams.

Student Learning Outcomes

At the end of this course, you should be able to

- with background knowledge of chemistry and physics and introductory biology, explain the function of excitable cells such as neurons and muscle, and how they regulate movement
- describe the role of the central nervous system in integrating sensory information and creating appropriate responses during locomotion
- explain the role of the autonomic nervous system in controlling vertebrate physiology
- with background knowledge of chemistry and physics and introductory biology, explain the function of the digestive system, and how it extracts chemical energy from the environment
- describe how that energy is stored, mobilized and used
- describe how nitrogenous wastes are eliminated
- explain the role of the endocrine system in controlling vertebrate physiology
- describe the neural and hormonal control of the reproductive system

Statement Regarding Students with Disabilities:
Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Link to Statement of Expectations for Student Conduct: