Calendar Description

The course is designed to promote a broad understanding of the physiological processes of the major tissues and organ systems in animals, the regulatory mechanisms that affect their function and the basis for the biochemical tests that are used to evaluate them. After introducing the concepts of homeostasis, enzymology and circulating biochemical markers which are relevant to all systems, the course is presented in individual modules or learning blocks. For these sections, specific organ systems are presented, the relevant functional principles and biochemical tests are presented and the material is integrated through presentations of case material. The sections include: the function of the nervous system, hematology, renal system, water, electrolyte and acid-base balance, the respiratory system, cardiac function, cardiovascular hemodynamics, blood pressure, peripheral and regional circulation of blood, the endocrine system, digestion/metabolism and immunology. The homeostatic features and species variation of the different systems are emphasized where appropriate. Case examples presented in lectures and tutorials will highlight the use of normal values and biochemical abnormalities that develop when normal organ function is compromised.

Course Coordinator
Jonathan LaMarre - Ext. 54935, Room 3606, E-mail: jlamarre@uoguelph.ca

Instructors
Pawel Bartlewski – Ext. 53330, Room 2601; E-mail: pmbart@uoguelph.ca - Endocrinology
Brad Hanna – Ext. 54534, Room 1646D, E-mail: bhanna@uoguelph.ca - Respiratory System
Ron Johnson – Ext. 54041, E-mail: rjohns03@uoguelph.ca - Cardiovascular System
Jonathan LaMarre Ext. 54935, Room 3606; E-mail: jlamarre@uoguelph.ca – Nervous System, Hematology, Renal Physiology, Acid Base Physiology
Byram Bridle – Ext. 54657,Room PAHL 4834 bbridle@uoguelph.ca - Immunology
W. Glen Pyle – Ext. 54772, Room 1646E; E-mail: gpyle@uoguelph.ca - Cardiovascular System
Adronie Verbrugghe – Ext. 54034, OVCP 2148; E-mail: averbrug@uoguelph.ca - Nutrition
TBA – Digestive Physiology

Administrative Information
For questions regarding academic consideration, continuation of study, academic misconduct, safety, confidentiality, and experiential learning involving the use of animals, please refer to the Phase 1 information of the OVC website.

Course Objectives
The primary objective of this course is to understand the physiological processes mediated by the different tissues and organ systems, the intrinsic and extrinsic mechanisms and factors that control
their function and the changes that occur in specific measurable parameters when these systems are compromised. The course goals are based on the DVM 2000 Professional Competencies which include the general requirement that graduates develop a breadth and depth of understanding and that they apply scientific principles in the course of veterinary activities. In order to understand the changes in function that underlie disease, one must understand normal function and how it is reflected in certain biochemical tests. During this course, frequent reference will be made to disorders and disease states, the biochemical basis behind such disorders, how they affect normal physiology and how they are assessed.

Upon course completion, students should be able to:

1. Explain homeostasis and how it applies to whole-animal physiology and each system studied.
2. Demonstrate knowledge and understanding of each normal organ system function as applicable to veterinary medicine.
3. Demonstrate an understanding of the basis of enzymology and serum markers of organ function and physiology and explain specifically how these are useful diagnostic and prognostic aids in the management of disease.
4. Demonstrate knowledge of how multiple organs/systems participate in protein, carbohydrate and lipid metabolism.
5. Demonstrate basic knowledge of animal nutrition.
6. Integrate the knowledge in different sections of the course with relevant material from other courses and begin to apply this knowledge to clinical and pathophysiologial problems.

**Evaluation**

3 midterm exams and 2 final exams comprise the evaluation for the course, as outlined below.

**Midterms** (Value toward final grade - %)

1. Nervous System, Hematology, Enzymology (15)
2. Renal, Acid Base, Respiratory, Serum Biochemistry, Urinalysis (15)
3. Cardiovascular, Endocrinology (10)

**Total value of midterm marks towards final grade: 40**

**Final Exams** (Physiology and Biochemistry Final Exam 1: Physiology and Biochemistry only. Combined Exam: Includes material from Anatomy, Biochemistry, Histology, and Physiology. Only the Physiology and Biochemistry questions count towards final grade in this course).

**Final Exam Content:**

**Physiology and Biochemistry Final Exam 1:** Material from Digestive and Immunology sections (Worth 35% of final grade)

**Combined Exam:** Material from previously-tested sections in the course (Worth 25% of final grade)

**Total value of final exam marks towards final grade: 60**

**D2L and Practice Questions**

D2L quizzes and practice exam questions are available for some sections of this course in order to provide examples of the level of understanding expected on the midterm and final examinations. The quizzes will not form part of the final grade in the course.
Resources

Course Notes:
Notes, copies of the Powerpoint presentations and/or relevant additional material is provided via the course website in “Desire 2 Learn”. Printed versions of the notes will not be provided.

Required Course Material:
2. iClickers - can be purchased from OVC book barn or University Bookstore. Some second hand iClickers are also available on first come first serve basis at the University Bookstore.
3. Tizard, I. Veterinary Immunology, 9th edition (W.B. Saunders).

Recommended Texts
Guyton’s Textbook of Medical Physiology, 10th edition (W.B. Saunders)

Carbohydrate metabolism: pp 46-52, 54-58, 77-80
Ketone body formation: pp 102-106
Lipid metabolism: pp 83-97
Protein metabolism: pp 117-120, 124-129
Serum enzymes: pp 304-308, 315-322.
Hepatic function: pp 327-331, 337-344
Pancreatic function: pp 353-358
Skeletal muscle function: pp 415-416
Fluid, Electolyte and Acid/Base pp 485-516