

Veterinary Physiology and Biochemistry, VETM*3080

Fall/Winter 2017/18

2.0 Credits

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

Tarek Saleh - Ext. 54700, Room 2633, E-mail: tsaleh@uoguelph.ca

Instructors (in order of appearance)

Jonathan LaMarre Ext. 54935, jlamarre@uoguelph.ca – Hematology

Tarek Saleh - Nervous System, Renal Physiology, Acid Base Physiology, Respiratory Physiology

W. Glen Pyle – Ext. 54772, gpyle@uoguelph.ca - Cardiovascular System

Ron Johnson – Ext. 54041, rjohns03@uoguelph.ca - Cardiovascular System

Lynn O’Sullivan – Ext 54943. losulliv@uoguelph.ca - Cardiovascular Labs

Pawel Bartlewski –Ext. 53330, pmbart@uoguelph.ca - Endocrinology and Digestive System

Byram Bridle – Ext. 54657, bbridle@uoguelph.ca - Immunology

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. 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 the function each normal organ system 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. Integrate the knowledge in different sections of the course with relevant material from other courses and begin to apply this knowledge to clinical and pathophysiological 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 (15)
2. Renal, Acid Base, Respiratory, Serum Biochemistry, Urinalysis (15)
3. Cardiovascular, Endocrinology (10)

Total value of midterm marks towards final grade: 40%

Combined Final Exams (First Exam is Physiology and Biochemistry only. Second Combined Exam includes material from Anatomy, Biochemistry, Histology, and Physiology. Only the Physiology and Biochemistry questions count towards final grade in this course).

Combined Exam 1 Questions: Material from Digestive and Immunology sections (Worth 35% of final grade)

Combined Exam 2 Questions: Material from previously-tested sections in the course (Worth 25% of final grade)

Total value of FINAL exam marks towards final grade: 60%

Resources

Course Notes:

Course notes will be available at the course website in Courselink. Printed versions of the notes will not be provided.

Required Course Material

1. Cunningham, J.G. (Ed), Textbook of Veterinary Physiology, 5th Edition (W.B. Saunders).

Recommended Texts

Guyton's Textbook of Medical Physiology, 13th Edition (W.B. Saunders)

Tizard, I. Veterinary Immunology, 9th edition (W.B. Saunders).

Lorenz, M.D. and Kornegay, J.N., Handbook of Veterinary Neurology, 4th edition (W.B. Saunders)

Suggested Additional Readings: Clinical Chemistry of Domestic Animals, 5th edition. Edited by JJ Kaneko, JW Harvey and ML Bruss