

# ANIMAL SCIENCE (ANSC)

## **ANSC\*6010 Topics in Comparative Animal Nutrition Fall Only [0.50]**

Current topics in the feeding and nutrition of agricultural, companion and captive animal species. Emphasis is placed on the influence of nutrients on metabolic integration at tissue, organ and whole-animal levels. A nutritional case study will be conducted to allow students to solve practical feeding problems by applying basic nutritional principles.

**Offering(s):** Annually

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6030 Modelling Metabolic Processes Fall Only [0.50]**

Building and testing of mathematical models of metabolic processes using continuous simulation software to assist in weekly assignments. Choice of model based on students' research interests (e.g. protein synthesis, nutrient uptake, rumen fermentation). Term project to reproduce model from scientific knowledge.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6070 Metabolic Regulation of Reproduction Fall Only [0.50]**

Reproductive function in mammals demands substantial amounts and adequate balance of nutrients and energy. Consequently, reproductive physiology is tightly regulated by systemic and tissue-specific metabolism. This course uses a multidisciplinary approach to explore the metabolic regulation of reproduction and its implications to reproductive health, fertility, and developmental biology. Students should have a strong background in reproductive physiology and a good understanding of molecular and cellular biology and scientific methods prior to enrolling.

**Offering(s):** Odd-numbered years

**Prerequisite(s):** ANSC\*3040

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6100 Special Project Summer, Fall, and Winter [0.50]**

Supervised program of study in some aspect of animal and poultry science that can involve an experimental project and/or detailed analysis of the literature.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6210 Principles of Selection in Animal Breeding Winter Only [0.50]**

Definition of selection goals, prediction of genetic progress and breeding values, and the comparison of selection programs.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6240 Topics in Animal Genetics and Genomics Winter Only [0.50]**

Current literature and classical papers pertaining to quantitative genetics, animal breeding and animal genomics are reviewed in detail through presentation, discussion and critical analysis.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6250 Growth and Metabolism Winter Only [0.50]**

Animal growth and metabolism are considered at the cellular level in a manner that extends beyond the basic disciplines of biometrics and biochemistry with attention focused on the main carcass components - muscle, fat and bone.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6330 Topics in Computational Biology and Bioinformatics Fall Only [0.50]**

Major topics and methods in bioinformatics and computational biology relevant to animal sciences and other agricultural fields will be covered. Subjects covered encompass various choices ranging from sequence alignments, phylogenetics, sequence databases, to DNA, RNA, and protein structures, as well as computer programming in Python and data analysis.

**Offering(s):** Offered annually

**Restriction(s):** Restricted to MSc and PhD Animal Biosciences students.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6350 Machine Learning Modelling for Animal Biosciences Winter Only [0.50]**

The course covers major topics in machine learning with applications to animal biosciences and related areas. Topics include: data types, problem types (classification, regression, clustering, dimensionality reduction), models (decision trees, artificial neural networks, k-nearest neighbour, k-means), quality measures (accuracy, precision, recall, errors, correlations), data (re)sampling procedures (k-fold cross validation, fixed percentage splits), and Python implementations using various libraries (pandas, scipy, numpy, scikit-learn). This is a project-based course and it will have a computational component and a lab component focused on Python programming. [Restriction(s):Restricted to MSc and PhD Animal Biosciences students.]

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6360 Techniques in Animal Nutrition Research Winter Only [0.50]**

Theory and/or practices of techniques to evaluate feedstuffs and determine nutrient utilization in poultry, swine and ruminants is covered through lectures, short laboratories and a major project.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6370 Quantitative Genetics and Animal Models Fall Only [0.50]**

The course covers quantitative genetics theory associated with animal models; linear models applied to genetic evaluation of animals; estimation of genetic parameters for animal models; and computing algorithms for large datasets.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6390 QTL and Genetic Markers Winter Only [0.50]**

Advanced training in QTL mapping and selection assisted by genetic markers.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

## **ANSC\*6400 Mammalian Reproduction Winter Only [0.50]**

Discussions and applications of methodology for collection and examination of gametes and embryos and for measurements of hormones in biological fluids.

**Offering(s):** Odd-numbered years

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6440 Advanced Critical Analysis in Applied Ethology Fall Only [0.50]**

Students explore the process of scientific inquiry and experimental design within the context of applied ethology research. Discussions include the peer review process, critical analyses and applications of methods for applied animal behaviour research.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6450 Topics in Animal Biotechnology Fall Only [0.50]**

The course will explore current methods and recent advances of biotechnology, innovation, and emerging translational products of significance to animal production and human health.

**Prerequisite(s):** MCB\*2050 or MBG\*2040 or ANSC\*4050

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6460 Lactation Biology Fall Only [0.50]**

An in-depth systems analysis of lactation, comparing the cow, pig, rat, human and seal. Mammary development from conception through to lactogenesis, lactation and involution will be covered. Hypotheses of regulation of the biochemical pathways of milk synthesis will be tested in relation to experimental observations.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6470 Advanced Animal Nutrition and Metabolism I Fall Only [0.50]**

A systematic review of key aspects of energy, protein, amino acid and carbohydrate utilization and metabolism in farm animals.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6480 Advanced Animal Nutrition and Metabolism II Winter Only [0.50]**

A systematic review of key aspects of lipid, vitamin and mineral utilization and metabolism in farm animals.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6490 Advanced Dairy Management Winter Only [0.50]**

A comprehensive systems science and integrative capstone course that encompasses the "closing of the loop" education of dairy production systems. Students will be exposed to real-time issues relating to dairy production from, environment, economics, nutrition, housing, health, welfare, society and agrology. This course will allow the student to practice their training from the courses they have been exposed to as undergraduates into many case study evaluations on farms provincially, nationally and internationally.

**Restriction(s):** Instructor consent required.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6550 Systematic Review and Meta-Analysis for Animal Biosciences Winter Only [0.50]**

Major topics and methods in the systematic review of the scientific literature, meta-analysis, and empirical modeling for animal sciences will be covered. Students learn via hands-on 'doing' with reflection on their work via the execution of a meta-analysis in their topic area and preparation of a meta-analysis manuscript.

**Offering(s):** Annually

**Co-requisite(s):** UNIV\*6020

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6610 Scientific Communication, Knowledge Dissemination and Professional Development Fall Only [0.50]**

This course helps to foster graduate student career success in academia, government or industry by enhancing student skills in scientific communication and knowledge dissemination and by providing opportunities for personal growth in a chosen area of professional development.

**Offering(s):** Annually

**Restriction(s):** Restricted to Animal Biosciences students.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6700 Animals in Society: Historical and Global Perspectives on Animal Welfare Fall Only [0.50]**

A seminar course covering society's duties to animals. Students will learn about the major ethical theories that deal with society's duties towards animals, the main scientific approaches to animal welfare, and the relationship of science to ethics. A brief history of human-animal relationships will be covered and cultural differences described. Students will use this to analyze some current issues.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6710 Assessing Animal Welfare in Practice Winter Only [0.50]**

A lecture/seminar course covering the principles of applied animal welfare assessment. Students will learn what influences an animal welfare assessment and will understand the components necessary to create an effective and targeted animal welfare program for industry or regulatory application.

**Offering(s):** Winter offering on-campus, Summer offering Distance Education.

**Prerequisite(s):** ANSC\*6700

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6730 Applied Environmental Physiology and Animal Housing Winter Only [0.50]**

A lecture/seminar course covering the principles of applied environmental physiology including temperature regulation, space requirements, animal responses to light and other aspects of the physical environment. Students pursue a topic in depth to develop or update recommended codes of practice and resource-based standards.

**Restriction(s):** Cannot take if credit received for ANSC\*4080 or ANSC\*4100.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6740 Special Topics in Applied Animal Welfare Science Winter and Summer [0.50]**

A lecture/seminar course covering in depth topics in applied animal welfare science. The course will review the scientific research into the welfare of a specific animal species or a specific animal welfare problem common across species, focusing on the main threats to welfare, relevant indicators of welfare, and possible solutions to improve welfare.

**Offering(s):** Annually.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph

**ANSC\*6900 Major Paper in Animal Biosciences Summer, Fall, and Winter [1.00]**

A detailed, critical review of an area of study related to the specialization of students in the MSc by course work and major paper option that includes analysis and interpretation of relevant data.

**Department(s):** Department of Animal Biosciences

**Location(s):** Guelph