

## ANIMAL, NUTRITION AND FOOD SCIENCES

<http://www.uvm.edu/nfs/>

### OVERVIEW

An interdisciplinary program leading to the Ph.D. degree in Animal, Nutrition and Food Sciences is offered under the direction of a committee composed of faculty members drawn from the departments of Animal and Veterinary Sciences and Nutrition and Food Sciences. The goal of this interdisciplinary program is to provide advanced education and research training in mammalian physiology and endocrinology, mammary gland biology, basic and applied nutrition, animal genetics, and food microbiology and technology. While all Ph.D. students will complete a common core of courses, they will choose from one of three tracks for specialized study: nutrition, food sciences, or animal science. The program provides flexibility necessary for students to gain competence in the area of their choice. The extensive research facilities of the participating departments are available to all graduate students enrolled in the program.

Currently, only the Animal Science track is accepting students.

### DEGREES

- Animal, Nutrition and Food Sciences Ph.D.

### FACULTY

**Barlow, John;** Associate Professor, Department of Animal and Veterinary Sciences; DVM, University of Illinois Urbana-Champaign; PHD, University of Vermont

**Blauwiel, Ruth;** University Veterinarian, Department of Animal and Veterinary Sciences; DVM, Michigan State University, PHD, Washington State University

**Dann, Heather;** Adjunct Assistant Professor, Department of Animal and Veterinary Sciences; PHD, University of Illinois

**Fobare Erickson, Patricia Ann;** Senior Lecturer, Department of Animal and Veterinary Sciences; DVM, Cornell University

**Grant, Richard;** Adjunct Professor, Department of Animal and Veterinary Sciences; PHD, Purdue University

**Greenwood, Sabrina Louise;** Associate Professor, Department of Animal Science and Veterinary Sciences; PHD, University of Guelph

**Guo, Ming Ruo;** Professor, Department of Nutrition and Food Science; PHD, University College Cork

**Kraft, Jana;** Associate Professor, Department of Animal and Veterinary Sciences; PHD, Friedrich-Schiller-University of Jena

**McKay, Stephanie Dawn;** Associate Professor, Department of Animal and Veterinary Sciences; PHD, University of Alberta

**Smith, Julia M.;** Research Associate Professor, Department of Animal and Veterinary Sciences; DVM, Cornell University

**Testroet, Eric;** Assistant Professor, Department of Animal and Veterinary Sciences; PHD, Iowa State University

**Townson, David H;** Professor, Department of Animal and Veterinary Sciences, PHD, Ohio State University

**Zhao, Feng-Qi;** Professor, Department of Animal and Veterinary Sciences; PHD, University of Alberta

### Animal, Nutrition Food Sci Courses

#### ANFS 313. Food Safety and Public Policy. 3 Credits.

An exploration of issues that impact the development of microbiological food safety policy through analysis of how science and risk assessment are used in establishing policy. Pre/co-requisite: NFS 203 or Pre/co-requisites: NFS 203 or NFS 253 or Instructor permission. Cross-listed with: NFS 313.

#### ANFS 395. Advanced Special Topics. 1-18 Credits.

Lectures, laboratories, readings, or projects relating to topics in animal, nutrition and food sciences. Pre/co-requisite: Graduate standing.

#### ANFS 491. Doctoral Dissertation. 1-18 Credits.

#### ANFS 496. Advanced Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

### Animal Sciences Courses

#### ASCI 215. Physiology of Reproduction. 3 Credits.

Fundamental principles of the physiology of reproduction with emphasis on, but not limited to, farm animals. Prerequisite: ASCI 141 or equivalent or Instructor permission.

#### ASCI 216. Endocrinology. 3 Credits.

Physiology of endocrine and autocrine/paracrine systems and growth factors. Prerequisites: BIOL 001 or BCOR 011 and ASCI 141 or ANPS 019 or ANPS 020.

#### ASCI 220. Lactation Physiology. 3 Credits.

Physiological mechanisms that control and affect lactation in domestic and laboratory animals with emphasis on dairy cattle. Includes mammary anatomy, development and health, and milk synthesis. Prerequisite: One Chemistry course and one course in Anatomy and Physiology, or Instructor permission.

#### ASCI 230. Agricultural Policy & Ethics. 3 Credits.

Examines American agriculture and policies from various perspectives - historical, political, ecological, technological, social, economic, and ethical. Emphasis on contemporary issues, policy options, future developments. Prerequisite: Junior standing or permission.

#### ASCI 263. Clin Top: Companion Animal Med. 3 Credits.

The use of case studies in companion animal medicine to develop clinical, analytical, and diagnostic skills. Prerequisites: ASCI 118, ASCI 141; Junior standing.

#### ASCI 264. Clin Topics: Livestock Medicine. 3 Credits.

An advanced study of diseases in cattle, sheep, goats, and pigs, emphasizing disease detection, pathobiology, treatment and prevention. Prerequisites: ASCI 118, ASCI 141, Junior standing.

#### ASCI 272. Adv Top: Zoo, Exotic, Endang Spec. 3 Credits.

An exploration of modern zoo philosophy and ethics and the extent of human intervention necessary for the preservation of endangered species. Prerequisites: ASCI 171 and Instructor permission.

**ASCI 297. Advanced Special Topics. 1-18 Credits.**

Written courses, seminars or topics beyond the scope of existing offerings. See Schedule of Courses for specific titles. Prerequisite: Department Chair permission. May enroll more than once for maximum of fifteen hours.

**ASCI 298. Advanced Special Topics. 1-18 Credits.**

Written courses, seminars or topics beyond the scope of existing offerings. See Schedule of Courses for specific titles. Prerequisite: Department Chair permission. May enroll more than once for maximum of fifteen hours.

**ASCI 301. ASCI Graduate Journal Club. 1 Credit.**

Students learn to critically read and discuss current scientific literature in terms of scientific method and merit. Pre/corequisite: Graduate standing.

**ASCI 302. ASCI Graduate Seminar. 1 Credit.**

Topics of current faculty and graduate student interest presented in a seminar-discussion format. Pre/corequisite: Graduate standing.

**ASCI 303. Research Proposal Writing. 2 Credits.**

Students discuss and practice the grant/proposal writing process by developing and writing a research proposal in response to a specific request for proposals. Students practice grant writing and review, and they share their work and review the work of others. Pre/Co-requisites: Graduate standing; recommended be taken prior to/during the semester of student's first committee meeting.

**ASCI 322. One Health: Zoonoses. 3 Credits.**

Zoonoses and vector-borne disease account for the majority of emerging and re-emerging diseases. Students will learn about the drivers that influence infection in animals and humans, tools used for disease monitoring and prevention, and policies and programs aimed at prevention. Cross-listed with: PH 322.

**ASCI 391. Master's Thesis Research. 1-10 Credits.****ASCI 392. Independent Literature Rsch. 1-6 Credits.**

Reading and literature research culminating in a paper on a topic of current interest in Animal Sciences.

**ASCI 395. Special Topics. 1-6 Credits.****ASCI 396. Advanced Special Topics. 1-6 Credits.****ASCI 491. Doctoral Dissertation Research. 1-12 Credits.****ASCI 496. Advanced Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**Nutrition and Food Sciences Courses****NFS 203. Food Microbiology. 3 Credits.**

Desirable and undesirable activities of bacteria in foods. Mechanisms of food-borne infection and intoxication. Laboratory methods to enumerate and identify microorganisms associated with food. Prerequisite: NFS 153 or Instructor permission. Co-requisite: NFS 213.

**NFS 205. Functional Foods:Prncpl & Tech. 3 Credits.**

Examines the constituents that make food products functional and provides laboratory techniques needed to create a functional food. Prerequisites: NFS 153, NFS 154, or Instructor permission.

**NFS 223. Nutrition Educ & Counseling. 3 Credits.**

Use of appropriate education theory, techniques, and media in nutrition education and counseling theories and negotiation, interviewing and counseling skills in individual and group counseling. Pre/co-requisites: NFS Prerequisites: NFS 043, NFS 053, NFS 054, NFS 143.

**NFS 243. Advanced Nutrition. 3 Credits.**

Study of nutrients and their specific functions in metabolic process integrating cellular physiology, biochemistry, and nutrition. Prerequisites: NFS 043, ANPS 019, NFS 183 or P BIO 185; minimum Junior standing. Spring.

**NFS 244. Nutr in Hlth & Disease Prevntn. 3 Credits.**

Examination of dietary planning, nutrition assessment, genetics, drug-nutrient interactions, CAM therapies and nutrition related to health and prevention of disease. Pre/co-requisites: NFS 053, NFS 054, NFS 143; minimum Junior standing.

**NFS 250. Foodservice Systems. 4 Credits.**

Emphasis on the foodservice system model for understanding quality control; food procurement, production, and marketing; management and evaluation of foodservice facilities, human and financial resources. Prerequisites: BSAD 060 or CDAE 158; BSAD 120; minimum Junior standing; Dietetics or Nutrition and Food Sciences, and Dietetics, Nutrition and Food Sciences majors only.

**NFS 253. Food Regulation. 3 Credits.**

Comprehensive examination of U.S. food laws and regulations and their relationships to the safety of the U.S. food supply. Focus on how food-related laws and regulations are enacted and enforced, through detailed examination of selected food regulation topics. Prerequisite: NFS 153 or equivalent course/training with Instructor permission.

**NFS 260. Diet and Disease. 3 Credits.**

Examination of the physiologic, biochemical, and psychosocial basis of several disease states and the application of medical nutrition therapy in treatment. Prerequisite: NFS 053, NFS 143, NFS 243; Senior standing.

**NFS 262. Community Nutrition. 3 Credits.**

Study of U.S. public health nutrition policies, programs and practices. Emphasis on community nutrition program planning including needs assessment, intervention development and evaluation. Prerequisite: Minimum Junior or Graduate standing. Spring.

**NFS 263. Nutritional Biochemistry. 3 Credits.**

Comprehensive study of metabolism of carbohydrates, lipids, and protein emphasizing diet induced, hormone mediated alterations in metabolism (e.g. starvation and obesity). Prerequisite: NFS 243 or Instructor permission. Spring.

**NFS 295. Advanced Special Topics. 1-18 Credits.**

Lectures, laboratories, readings, or projects relating to contemporary areas of study. Credits negotiable. Enrollment may be more than once, maximum of twelve hours in NFS 195 and NFS 295 combined. Prerequisite: Department permission.

**NFS 296. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion. Prerequisite: Departmental permission.

**NFS 310. MSD Journal Club. 1 Credit.**

Critical review of current scientific, peer-reviewed literature, student-led facilitated discussions, abstract writing on topics related to nutrition, sustainable food systems, hunger and food insecurity, health promotion, chronic disease prevention and management. Prerequisite: Master of Science in Dietetics students only.

**NFS 311. Supervised Practice I. 4 Credits.**

Through lecture, discussion, presentations, and practical experience, students develop competencies in clinical dietetics, community nutrition, and food service management. Prerequisite: Master of Science in Dietetics student.

**NFS 312. Supervised Practice II. 4 Credits.**

Through lecture, discussion, presentations, and practical experience, students develop competencies in clinical dietetics, community nutrition, and food service management. Prerequisite: Master of Science in Dietetics student.

**NFS 313. Food Safety and Public Policy. 3 Credits.**

An exploration of issues that impact the development of microbiological food safety policy through analysis of how science and risk assessment are used in establishing policy. Prerequisites: NFS 203 or NFS 253 or Instructor permission. Cross-listed with: ANFS 313.

**NFS 350. Nutrition&Food Science Seminar. 1 Credit.****NFS 360. Rsch Meth Nutr & Food Sciences. 3 Credits.**

Advanced research methods, including grant preparation, IRB requirements, data analysis and presentation, and selected topics in advanced nutritional and food sciences. Pre/Co-requisite: Instructor permission.

**NFS 390. Master's Project Research. 3-6 Credits.**

Final project under the direction of a graduate faculty mentor. Prerequisite: Nutrition and Food Sciences non-thesis Graduate Student, Instructor permission.

**NFS 391. Master's Thesis Research. 1-18 Credits.**

Prerequisite: Master of Science in Dietetics student.

**NFS 392. Evidence-based Practice Prjct. 1-2 Credits.**

On site identification, review of literature for background and possible solutions, data collection and analysis, and writing and presenting the results and conclusions of a research problem. Pre/co-requisites: NFS 360, Pre/co-requisites: NFS 360, MS D student.

**NFS 395. Special Topics. 1-18 Credits.****NFS 396. Advanced Special Topics. 1-18 Credits.**