

Poultry Science (POSC)

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Department of Poultry Science website (<http://poultry-science.uark.edu>)

Degrees Conferred:
 M.S., Ph.D. (POSC)

Primary Areas of Faculty Research: Avian parasitology, avian physiology, avian virology, food safety/microbiology, immunology, molecular biology, poultry breeding and genetics, poultry economics, poultry enterprise operations, poultry health, poultry meat quality, poultry nutrition, poultry product technology, and turkey and egg product/management.

Areas of Study: Graduate studies may be pursued in those areas of primary faculty research. Poultry and laboratory animals are available for research programs in the Poultry Science Department.

M.S. in Poultry Science

Prerequisites to Degree Program: The student pursuing a program for a Master of Science degree must meet all general requirements of the Graduate School. In addition, the student must have completed the B.S. degree in a college or university with a major or equivalent in one of the areas of the poultry science department. All applicants must submit at least three letters of recommendation and scores on the Graduate Record Examinations.

For acceptance into the Ph.D. degree program, a grade-point average of 3.00 on all previous graduate work and scores on the Graduate Record Examinations must be presented.

Requirements for the Master of Science Degree: For the M.S. degree, at least 24 hours of course work and six hours of thesis must be completed. No more than 12 hours or three courses at the 4000 level may be used for credit. A maximum of four hours of 5000 Special Problems may be used for M.S. degree requirements. At least three courses should be taken in the Poultry Science Department. At least one seminar is required for all M.S. degree candidates. A minimum GPA of 3.0 is required for the M.S. degree. All M.S. candidates must complete a thesis based on their research and pass a final comprehensive exam with emphasis on thesis research. One manuscript suitable for publication in a refereed journal is required for each M.S. candidate to graduate.

Students should also be aware of Graduate School requirements with regard to master's degrees (<http://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreestext>).

Ph.D. in Poultry Science

Prerequisites to Degree Program: The student pursuing a program for a Master of Science degree must meet all general requirements of the Graduate School. In addition, the student must have completed the B.S. degree in a college or university with a major or equivalent in one of the areas of the poultry science department. All applicants must submit at least three letters of recommendation and scores on the Graduate Record Examinations.

For acceptance into the Ph.D. degree program, a grade-point average of 3.00 on all previous graduate work and scores on the Graduate Record Examinations must be presented.

Requirements for the Doctor of Philosophy Degree: Ph.D. candidates bypassing the M.S. degree must take at least 36 hours of course work approved by the student's advisory committee with at least 24 hours of 5000 and 6000 level course work excluding Special Problems. No more than 12 hours or three courses at the 4000 level may be used for credit. A maximum of four hours of 5000 Special Problems can be used for the Ph.D. degree requirements. Students in the Ph.D program who have an M.S. degree must take at least 12 hours of 5000 and 6000 level course work excluding Special Problems. If not taken previously, a three hour statistics course is required for graduation for all Ph.D. candidates. A minimum of two seminars is required of all Ph.D. candidates. All Ph.D. degree candidates must take 18 hours of dissertation research. Admission to candidacy requires the candidate to take a comprehensive written exam as determined by members of the student's Graduate Advisory Committee and a preliminary oral exam given by the Graduate Advisory Committee. Any student who fails the admission to candidacy exams will not be permitted to reschedule the exams for a six-month period. A second failure will lead to termination from the program. A final oral examination will be taken that is a defense of the dissertation. A minimum GPA of 3.0 is required for the Ph.D. degree. Two manuscripts suitable for publication in a refereed journal are required for each Ph.D. student to graduate. These papers will be evaluated by the Graduate Advisory Committee for comments and approval.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (<http://catalog.uark.edu/graduatecatalog/degreerequirements/#phdandedddegrestext>).

Graduate Faculty

Alrubaye, Adnan A., Ph.D., M.Ed. (University of Arkansas), M.Sc. (University of Baghdad), Assistant Professor, 2016, 2021.

Bottje, Walter G., Ph.D. (University of Illinois-Urbana-Champaign), M.S. (Southern Illinois University), B.S. (Eastern Illinois University), Professor, 1985, 1993.

Caldwell, David J., Ph.D., M.S., and B.S. (Texas A&M University), Professor, 2019.

Clark, Fred D., Ph.D., D.V.M., M.S., B.S. (Texas A&M University), Extension Professor, 1994, 2007.

Coon, Craig N., Ph.D., M.S., B.S. (Texas A&M University), Professor, 1997.

Donoghue, Annie, Ph.D. (F. Edward Herbert School of Medicine), M.S. (Texas A&M University), B.S. (San Diego State University), Research Professor, 2000.

Dridi, Sami, Ph.D., M.S. (National Polytechnic Institute of Lorraine, France), B.S. (Superior Institute of Mateur, Tunisia), Professor, 2013, 2018.

Erf, Gisela F., Ph.D. (Cornell University), M.S., B.S. (University of Guelph, Canada), Professor, Avian Immunology Professorship, 1994, 2004.

Hanning, Casey Owens, Ph.D., M.S., B.S. (Texas A&M University), Professor, 2000, 2017.

Hargis, Billy M., Ph.D., D.V.M. (University of Minnesota-Twin Cities), M.S. (University of Georgia), B.S. (University of Minnesota), Distinguished Professor, Sustainable Poultry Health Chair, 2000, 2017.

Kidd, Michael T., Ph.D. (North Carolina State University), M.S., B.S.A. (University of Arkansas), Professor, 2010.

Kong, Byungwhi, Ph.D., M.S. (University of Minnesota-Twin Cities), B.S. (Korea University), Associate Professor, 2006, 2012.

Kuenzel, Wayne J., Ph.D. (University of Georgia), M.S., B.S. (Bucknell University), Professor, 2000.

Kwon, Young Min, Ph.D. (Texas A&M University), M.S., B.S. (Seoul National University), Associate Professor, 2002, 2008.

Marcy, John A., Ph.D., M.S. (Iowa State), B.S. (University of Tennessee), Extension Professor, 1993, 2006.

Orlowski, Sara K., Ph.D., M.S. (University of Arkansas), B.S. (Cornell University), Assistant Professor, 2019.

Rath, Narayan C., Ph.D., M.S. (University of Delhi-India), B.S. (Utkal University-India), Research Professor, 1992, 1998.

Rochell, Samuel J., Ph.D. (University of Illinois at Urbana-Champaign), M.S., B.S. (Auburn University), Assistant Professor, 2016.

Sun, Xiaolun, Ph.D., M.S. (Virginia Polytech Institute and State University), B.S. (Southern China Agricultural University), Assistant Professor, 2016.

Tellez-Isaias, Guillermo, Ph.D. (Texas A&M University), Visiting Professor, 2002.

Wideman, Robert F., Ph.D. (University of Connecticut), B.A. (University of Delaware), Professor, 1993.

Courses

POSC 500V. Special Problems. 1-6 Hour.

Work in special problems of poultry industry. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

POSC 5033. Statistical Process Control in the Food Industry. 3 Hours.

Analysis of processing data related to compliance with regulatory limits, quality and safety limits and internal and external customer specifications. Emphasizes statistical process control chart development, including understanding data and chart selection, calculating statistical limits, and interpreting process performance. Graduate degree credit will not be given for both POSC 4033 and POSC 5033. Prerequisite: Instructor consent. (Typically offered: Irregular)

POSC 510V. Special Topics in Poultry Sciences. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in poultry science. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

POSC 5113. Food Toxicology and Contaminants. 3 Hours.

During this course, the student will learn basic concepts of food toxicology, study the different physiological processes involved in food borne intoxications, and learn about potential health problems associated with exposure to these compounds. Prerequisite: Graduate study. (Typically offered: Irregular)

POSC 5123. Advanced Animal Genetics. 3 Hours.

Specialized study of animal genetics. Lecture 3 hours per week. Prerequisite: POSC 3123 or ANSC 3123. (Typically offered: Fall Even Years) This course is cross-listed with ANSC 5123.

POSC 5143. Biochemical Nutrition. 3 Hours.

Interrelationship of nutrition and physiological chemistry; structure and metabolism of physiological significant carbohydrates, lipids, and proteins; integration of metabolism with provision of tissue fuels; specie differences in regulatory control of tissue and whole body metabolism of nutrients. Prerequisite: CHEM 3813. (Typically offered: Fall Even Years)

This course is cross-listed with ANSC 5143.

POSC 5152. Protein and Amino Acid Nutrition. 2 Hours.

Students will be introduced to the basic processes of protein digestion, amino acid absorption, transport, metabolism, and utilization along with how biochemical function of proteins and their dynamic state affect nutritional status for animals and man. Prerequisite: CHEM 3813. (Typically offered: Spring Even Years)

This course is cross-listed with ANSC 5152.

POSC 5163. Companion Animal Nutrition. 3 Hours.

This course is designed to focus on the digestive anatomy, physiology, and nutrient metabolism of non-herbivorous companion animals, primarily dogs and cats. Topics discussed will also include an overview of the pet food industry, its regulations and commonly utilized ingredients. Students will gain a deeper understanding of nutrition as it relates to life stages and various disease states that can affect both dogs and cats. This course will require a Saturday trip to one or two off campus facilities. Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Spring)

This course is cross-listed with ANSC 5163.

POSC 5213. Integrated Poultry Management Systems. 3 Hours.

Major managerial systems in the integrated commercial poultry industry. Development of an understanding of the basic decision making processes of poultry companies and the factors influencing those decisions. Graduate degree credit will not be given for both POSC 4213 and POSC 5213. Prerequisite: POSC 2353 and AGEC 1103 and AGEC 2303. (Typically offered: Fall)

POSC 5233. Value Added Muscle Foods. 3 Hours.

An intense study of muscle structure and how it relates to the development of further processed meat products. Muscle ultrastructure, protein functionality, product development, and quality analysis will be covered. In class hands on activities will also be included to allow students to obtain experience of producing processed meat products. (Typically offered: Spring Even Years)

POSC 5243. Legal Issues in Animal Agriculture. 3 Hours.

An issues-oriented course focusing on the legal issues involved in the production of poultry, swine and livestock. Emphasis will center on the laws, regulations and policy arguments involved in animal confinement, antibiotic use, humane slaughter and veterinary medicine, along with other related issues. The wide range of regulation from local to state to federal, depending on the issue will be studied and discussed. Graduate degree credit will not be given for both POSC 4123 and POSC 5243. (Typically offered: Spring Odd Years)

POSC 5254. Egg and Meat Technology. 4 Hours.

Study of the science and practice of processing poultry meat and egg products; examination of the physical, chemical, functional and microbiological characteristics of value added poultry products; factors affecting consumer acceptance and marketing of poultry products and the efficiency of production. Graduate degree credit will not be given for both POSC 4314 and POSC 5254. Corequisite: Lab component. Prerequisite: (CHEM 1123 and CHEM 1121L) or (CHEM 1073 and CHEM 1071L) and BIOL 1543 and BIOL 1541L. (Typically offered: Fall)

POSC 5313. Domestic Animal Bacteriology. 3 Hours.

A study of bacteria pathogenic for domestic animals. Lecture 3 hours per week. (Typically offered: Fall)

POSC 5333. Poultry Breeding. 3 Hours.

Application of new developments in poultry breeding for efficient egg and meat production. Not intended for students interested in a career in veterinary sciences. Lecture 3 hours per week. Graduate degree credit will not be given for both POSC 4333 and POSC 5333. (Typically offered: Fall Odd Years)

POSC 5343. Advanced Immunology. 3 Hours.

Aspects of innate, cell-mediated, and humoral immunity in mammalian and avian species. Molecular mechanisms underlying the function of the immune system are emphasized. A course in Basic Immunology prior to enrollment in Advanced Immunology is recommended but not required. Lecture 3 hours per week. (Typically offered: Spring)

This course is cross-listed with BIOL 5343.

POSC 5352L. Immunology in the Laboratory. 2 Hours.

Laboratory course on immune-diagnostic laboratory techniques and uses of antibodies as a research tool. Included are cell isolation and characterization procedures, immunochemistry, flow cytometry, ELISA and cell culture assay systems. Laboratory 6 hours per week. Prerequisite: POSC 5343 or BIOL 5343 or BIOL 4713. (Typically offered: Spring)

This course is cross-listed with BIOL 5352L.

POSC 5443. Poultry Nutrition. 3 Hours.

Principles of nutrition as applied to the formulation of practical chicken and turkey rations. Lecture 3 hours per week. Graduate degree credit will not be given for both POSC 4343 and POSC 5443. Prerequisite: CHEM 2613 or CHEM 3603. (Typically offered: Spring)

POSC 5613. Muscle Growth and Development. 3 Hours.

This is a graduate level course offering detailed insights into skeletal muscle morphological, physiological, cellular and molecular factors affecting muscle structure and function, with special emphasis on cellular and molecular regulation of muscle growth and development, such as myo-, fibro-, and adipo-genesis. And the relationship between the properties of skeletal muscle and meat quality. Graduate students will focus on the scientific reading, problem solving, and generating research ideas. ANSC 3033, CHEM 3813 or ANSC 5143 or an equivalent course are recommended as a prerequisite. (Typically offered: Fall)

This course is cross-listed with ANSC 5613.

POSC 5742. Advanced Poultry Diseases. 2 Hours.

An in-depth coverage of the most important diseases of poultry with a focus on understanding mechanisms of pathogenesis, diagnostic techniques and principles of prevention. Lecture/discussion 2 hours per week. Prerequisite: POSC 3223. (Typically offered: Spring Odd Years)

POSC 5743L. Advanced Analytical Methods in Animal Sciences Laboratory. 3 Hours.

Introduction into theory and application of current advanced analytical techniques used in animal research. Two 3-hour laboratory periods per week. (Typically offered: Fall)

This course is cross-listed with ANSC 5743L.

POSC 5873. Molecular Analysis of Foodborne Pathogens. 3 Hours.

Course topics will include molecular detection and identification of foodborne pathogens, the molecular response of foodborne pathogens to their environments, functional genomic approaches, and analysis of complex microbial communities. Lecture/discussion 3 hours per week. (Typically offered: Fall)

POSC 5901. Graduate Seminar. 1 Hour.

Critical review of the current scientific literature pertaining to the field of poultry science. Oral reports. Recitation 1 hour per week. Prerequisite: Senior standing. (Typically offered: Fall and Spring)

POSC 5923. Brain and Behavior. 3 Hours.

Covers cellular through neural systems, major brain functions and comparative neuroanatomy. Topics include ion channels, membrane and action potentials, synaptic integration, neurotransmitters, major brain regions of mammals and birds, sensory and autonomic nervous systems, neuroendocrine system, and control by the brain of critical functions and behavior. Lecture 3 hours per week. Prerequisite: (ANSC 3033 or POSC 3033) or PSYC 2003 or BIOL 2213 or BIOL 2443 or BIOL 2533. (Typically offered: Fall)

This course is cross-listed with ANSC 5923.

POSC 5932. Cardiovascular Physiology of Domestic Animals. 2 Hours.

Cardiovascular physiology, including mechanisms of heart function and excitation, and blood vessel mechanisms associated with the circulatory system in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Fall)

This course is cross-listed with ANSC 5932.

POSC 5943. Endocrine Physiology of Domestic Animals. 3 Hours.

Endocrine physiology, including mechanisms of hormone secretion, function, and regulation. Mechanisms associated with the endocrine system will be discussed for domestic animals and poultry. Prerequisite: ANSC 3033 or POSC 3033. Pre- or Corequisite: CHEM 3813. (Typically offered: Spring Even Years)

This course is cross-listed with ANSC 5943.

POSC 5952. Respiratory Physiology of Domestic Animals. 2 Hours.

Respiratory physiology, including mechanisms of lung function and gas exchange. Mechanisms associated with the interaction of the respiratory system with other bodily systems in domestic animals and poultry will be discussed. Lecture 3 hours; drill 1 hour per week for first 8 weeks of semester. Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Spring)

This course is cross-listed with ANSC 5952.

POSC 5962. Gastrointestinal/Digestive Physiology of Domestic Animals. 2 Hours.

Gastrointestinal and hepatic physiology, including mechanisms of digestion, absorption of nutrients with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Fall)

This course is cross-listed with ANSC 5962.

POSC 5972. Renal Physiology of Domestic Animals. 2 Hours.

Renal physiology, including mechanisms of renal clearance with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Spring)

POSC 600V. Thesis. 1-6 Hour.

Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

POSC 6343. Vitamin Nutrition in Domestic Animals. 3 Hours.

The vitamins required by domestic animals with emphasis upon their role in animal nutrition, physiological functions, and consequences of failure to meet the requirement of the animal. Lecture 3 hours per week. Prerequisite: (ANSC 3143 or POSC 4343) and CHEM 3813. (Typically offered: Spring Even Years)

This course is cross-listed with ANSC 6343.

POSC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.