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: Poultry parasitology, poultry physiology, 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/#phdandedddegreestext).

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.
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.
Graham, Danielle, Ph.D., M.S., B.S. (University of Arkansas), Assistant Professor, 2022.
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, 2019.
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), Professor, 2002, 2016.
Orlowski, Sara K., Ph.D., M.S. (University of Arkansas), B.S. (Cornell University), Associate Professor, 2019, 2024.
Owens, Casey, Ph.D., M.S., B.S. (Texas A&M University), Professor, 2000, 2017.
Parsons, Benjamin, Ph.D. (University of Arkansas), M.S., B.S. (University of Illinois at Urbana Champaign), Assistant Professor, 2024.
Potter, Bill D., Ph.D., M.S. (University of Arkansas), M.B.A., B.S. (Texas A&M University), Associate Professor, 2024.
Sun, Xiaolun, Ph.D., M.S. (Virginia Polytech Institute and State University), B.S. (Southern China Agricultural University), Associate Professor, 2016, 2023.
Tellez-Isaias, Guillermo, Ph.D. (Texas A&M University), Research Professor, 2002, 2021.
Weimer, Shawna, Ph.D. (University of Arkansas), M.S., B.S. (Iowa State University), Assistant Professor, 2022.
Williams, Zac, Ph.D. (Auburn University), M.S., B.S. (Mississippi State University), Assistant Professor, 2023.

Courses

POSC 5000V. Special Problems. 1-6 Hour.
Work in special problems of poultry industry. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

POSC 50303. 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 40303 and POSC 50303. Prerequisite: Instructor consent. (Typically offered: Irregular)

POSC 5100V. 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 51103. 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: Spring Odd Years)

POSC 51203. Advanced Animal Genetics. 3 Hours.
Specialized study of animal genetics. Lecture 3 hours per week. Prerequisite: POSC 31203 or ANSC 31203. (Typically offered: Fall Even Years)
This course is cross-listed with ANSC 51203.

POSC 51403. 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 38103. (Typically offered: Fall Even Years)
This course is cross-listed with ANSC 51403.

POSC 51502. 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 38103. (Typically offered: Spring Even Years)
This course is cross-listed with ANSC 51502.

POSC 51603. 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 31433 or POSC 43403. (Typically offered: Spring)
This course is cross-listed with ANSC 51603.

POSC 52103. 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 42103 and POSC 52103. Prerequisite: POSC 23503 and AGEC 11003 and AGEC 23003. (Typically offered: Fall)

POSC 52203. Poultry Diseases. 3 Hours.
This graduate-level course will explore the mechanisms of pathogenesis associated with poultry diseases affecting poultry reared under commercial conditions. This will include anatomical gross diagnosis and testing associated with disease diagnosis. Therapy, prevention, immunity, sanitation/biosecurity practices and chemoprophylaxis will be covered. There will be three formal lectures each week at scheduled times, and an additional hour of instruction per week with the instructor. (Typically offered: Spring)

POSC 52303. 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 52403. 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 41203 and POSC 52403. (Typically offered: Spring Odd Years)

POSC 52504. 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 43104 and POSC 52504. Corequisite: Lab component. Prerequisite: (CHEM 14203 and CHEM 14201) or (CHEM 12103 and CHEM 12101) and BIOL 10103 and BIOL 10101. (Typically offered: Fall)

POSC 53103. Domestic Animal Bacteriology. 3 Hours.
A study of bacteria pathogenic for domestic animals. Lecture 3 hours per week. (Typically offered: Fall)

POSC 53203. Applied Poultry Parasitology. 3 Hours.
This course introduces students to the principles, diseases, and diagnostic tools related to parasitology with an emphasis on animal agriculture, specifically poultry. Corequisite: Lab component. (Typically offered: Spring)

POSC 53403. 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 53473.

POSC 53502. 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 53403 or BIOL 53473 or BIOL 47183. (Typically offered: Spring)
This course is cross-listed with BIOL 53572.

POSC 54103. Animal Welfare. 3 Hours.
This multi-disciplinary course introduces students to the principles and application of animal welfare and will emphasize farm animal welfare and production issues. (Typically offered: Spring)
This course is cross-listed with ANSC 54103.

POSC 54203. Applied Poultry Food Safety. 3 Hours.
This course is a three-hour lecture emphasizing on food safety, microbiology, and sanitation during poultry/meat production and processing, including government regulations influencing meat and poultry processing in the United States. (Typically offered: Fall)

POSC 54403. 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 43403 and POSC 54403. Prerequisite: CHEM 26103 or CHEM 36053. (Typically offered: Spring)

POSC 55402. Concepts in Nonruminant Nutrition. 2 Hours.
Students will be introduced to fundamental concepts in nutrition studies associated with feed/food intake, nutrient digestibility, nutrient bioavailability, and factorial analyses. New and classical nutrition literature will also be reviewed. (Typically offered: Fall)

POSC 56103. 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 30303, CHEM 38103 or ANSC 51403 or an equivalent course are recommended as a prerequisite. (Typically offered: Fall)
This course is cross-listed with ANSC 56103.

POSC 57433. 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 57403.

POSC 58703. 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 59001. 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. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

POSC 59302. 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 38103. Corequisite: Drill component. Prerequisite: ANSC 30303 or POSC 30303. (Typically offered: Fall)
This course is cross-listed with ANSC 59302.

POSC 59403. 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 30303 or POSC 30303. Pre- or Corequisite: CHEM 38103. (Typically offered: Spring Even Years)
This course is cross-listed with ANSC 59403.

POSC 59502. 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 38103. Corequisite: Drill component. Prerequisite: ANSC 30303 or POSC 30303. (Typically offered: Spring)
This course is cross-listed with ANSC 59502.

POSC 59602. 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 38103. Corequisite: Drill component. Prerequisite: ANSC 30303 or POSC 30303. (Typically offered: Fall)
This course is cross-listed with ANSC 59602.

POSC 59702. 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 38103. Corequisite: Drill component. Prerequisite: ANSC 30303 or POSC 30303. (Typically offered: Spring)

POSC 6000V. Thesis. 1-6 Hour.
Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

POSC 63403. Vitamin Nutrition and Metabolism. 3 Hours.
The vitamins required for humans and domestic animals for a healthy life with emphasis on absorption, transport, metabolism, biopotency, mechanism of action, tissue retention and turnover. Lecture 3 hours per week. Prerequisite: CHEM 38103. (Typically offered: Fall Odd Years)
This course is cross-listed with ANSC 63403, FDSC 63403.

POSC 7000V. Doctoral Dissertation. 1-18 Hour.
Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.