

**ANIMAL SCIENCE**[www.siu.edu/~animal](http://www.siu.edu/~animal)**COLLEGE OF AGRICULTURAL SCIENCES**

**Apgar, Gary A.**, Assistant Professor, Ph.D., Virginia Polytechnic Institute, 1994; 1998. Monogastric nutrition, swine production.

**Arthur, Robert**, Professor, Interim Dean, Ph.D., University of Missouri, 1970; 1977. Monogastric nutrition, biochemistry.

**Goodman, Bill L.**, Professor, *Emeritus*, Ph.D., Ohio State University, 1959; 1958.

**Hausler, Carl L.**, Associate Professor, *Emeritus*, Ph.D., Purdue University, 1970; 1970.

**Higginbotham, Allan**, Assistant Professor, Ph.D., Auburn University, 2001; 2002. Nutritional endocrinology, community nutrition.

**Hinners, Scott W.**, Professor, Ph.D., *Emeritus*, University of Illinois, 1958; 1951.

**Jones, Karen L.**, Assistant Professor, Ph.D., Texas A&M, 1999; 1999. Animal biotechnology.

**Kammlade, W. G., Jr.**, Associate Professor, *Emeritus*, Ph.D., University of Illinois, 1951; 1954.

**King, Sheryl S.**, Professor, Ph.D., University of California, Davis, 1983; 1983. Reproduction physiology, equine science.

**Kroening, Gilbert H.**, Professor, *Emeritus*, Ph.D., Cornell University, 1965; 1969.

**Martin, Michael P.**, Assistant Professor, D.V.M., MPVM, University of California at Davis, 1997, 2004. Veterinary Science, biosecurity.

**Olson, Howard H.**, Professor, *Emeritus*, Ph.D., University of Minnesota, 1952; 1954.

**Strack, Louis E.**, Associate Professor, *Emeritus*, D.V.M., University of Illinois, 1961; 1968.

**Welch, Patricia**, Professor and *Chair*, Ph.D., Southern Illinois University Carbondale, 1982, 1974. Nutrition.

**Winters, Todd A.**, Associate Professor, Ph.D., University of Wisconsin-Madison, 1992; 1994. Animal biotechnology, reproductive physiology.

**Woody, Harold Dee**, Associate Professor, Ph.D., Michigan State University, 1978; 1978. Ruminant nutrition, growth.

**Young, Anthony W.**, Professor, *Emeritus*, Ph.D., University of Kentucky, 1969; 1980. Ruminant nutrition, forages

The Department of Animal Science, Food and Nutrition offers programs of study leading to the Master of Science degree with a major in animal science. Programs may be designed in the various disciplines of nutrition, reproductive physiology, biotechnology and/ or growth and development with emphasis on beef cattle, dairy cattle, horses, or swine. Other animal or cell culture systems are sometimes used as research models.

Admission to programs administered by the Department of Animal Science, Food and Nutrition must be approved by the department. Application forms will be provided upon request from the department. Applicants must have the registrar of each college previously attended send official transcripts directly to the Graduate School.

**Requirements**

Minimum requirements for students entering the master's degree program are: (a) a bachelor's degree in Animal Science, Dairy Science, Biological Sciences, or related field; (b) a minimum 3.0 cumulative undergraduate G.P.A. ( $A=4.0$ ); (c) 1200 total score on Graduate Record Exam (GRE) with a score of at least 400 on two of the three general categories; (d) Statement of Research Interests; (e) Three letters of recommendation (at least two from undergraduate professors); (f) A minimum of 3 credit hours in upper-level organic chemistry with at least a C grade. Students can be admitted with a G.P.A. under 3.0 on a conditional basis and must enroll in a minimum of seven hours of structured courses at the 400-500 level during their first semester and achieve a B or better in each course or be dropped from the program. Organic chemistry deficiencies can be made up with undergraduate courses *at SIUC* as part of the student's graduate course work. However, undergraduate courses cannot be given graduate credit.

Minimum requirements for the master's degree may be fulfilled by satisfactory completion of 30 semester hours of graduate credit, with a minimum of 15 hours in animal science, a minimum of 15 hours of 500-level graduate courses, and at least 8 hours outside the College of Agricultural Sciences. A maximum of two animal production related courses (ANS 409, 430, 465, 485) may be counted for graduate credit. Additional University requirements are stated in the SIUC Graduate Catalog. Specific required course work include:

- a. Two semesters of ANS 581 (Seminar)
- b. Two semesters of graduate-level statistics (i.e. EPSY 506, 507, 508)
- c. Deficiencies in Organic Chemistry, if any.
- d. A minimum of one semester of upper-level biochemistry.

A maximum of two semesters involvement in laboratory and/or classroom teaching is also required. This requirement is to give candidates an opportunity to gain experience in teaching.

Each student will be mentored by a member of the Animal Science, Food and Nutrition faculty designated the major professor. The major professor will serve as the research mentor and academic advisor. A graduate advisory committee will be selected with consultation of the major professor. The committee will consist of no fewer than three graduate faculty members. Two members of the committee must be from the Animal Science,

Food and Nutrition faculty, and one of the members of the committee must be from outside the department. The major professor will chair the student's graduate committee.

All candidates are required to conduct original research resulting in a thesis. Participation in other research within the department is encouraged to provide a broader experience. Each master's degree candidate must pass a comprehensive oral examination covering all graduate work including the thesis.

Information concerning admission policies, requisites for graduation, and availability of financial assistance for graduate study in animal science may be obtained from the Department of Animal Science, Food and Nutrition, Southern Illinois University Carbondale, Carbondale, IL 62901-4417.

### Courses (ANS)

Field trips are required for certain courses.

**409-4 Equine Science.** Designed for students interested in the more scientific aspects of equine physiology and management. The class will take a more advanced look at anatomy and physiology of the systems of the equine and consider how they relate to selection, use and management. Lecture and laboratory. Lab fee \$50. Prerequisite: 219 and 331.

**415-4 Advanced Animal Nutrition.** Advanced principles and practices associated with digestion, absorption and metabolism of nutrients as related to domestic monogastrics, ruminants and horses. Prerequisite: 215 and 315.

**419-4 Stable Management.** Designed for the advanced equine science student planning a career in the horse field. Teaches in-depth management techniques on an applied basis. Students will have the opportunity to learn both theory and application of management in one course. One-hour lecture, four hours laboratory. Laboratory fee \$75. Prerequisite: 219, 409 and consent of department.

**421-2 International Animal Production.** A study of world animal production practices with emphasis on the developing countries. Adaptability of animals to environmental extremes and management practices employed to improve productivity. Prerequisite: junior standing plus Animal Science 121 or one year of biological science.

**426-3 Mammalian Endocrinology.** Comparative endocrinology of the effects of hormones on target tissues including mechanisms of hormone biosynthesis, release, transports, receptor kinetics, and signal transduction. Measurement of hormones, receptors, and signal transduction. Endocrine-related diseases and disorders. Prerequisite: course in physiology.

**430-4 Dairy Cattle Management.** Application of the principles of breeding, physiology and economics to management of a profitable dairy herd. Breeds of dairy cattle, housing, milking practices and quality milk production. Field trip. Students enrolled will incur field trip expenses of approximately \$25. Prerequisite: 315, 332.

**431-4 Reproductive Physiology.** Comparative anatomy and physiology of the male and female reproductive system of domestic animals; hormones; reproductive cycles; mating behavior; gestation and parturition; sperm physiology; collection and processing of semen; artificial insemination, pregnancy tests; diseases. Laboratory fee \$10. Prerequisite: 121 or a course in physiology.

**433-4 Introduction to Agricultural Biotechnology.** (Same as Plant and Soil Science 433.) This course will cover the basic principles of plant and animal biotechnology using current examples; gene mapping in breeding, transgenic approaches to improve crop plants and transgenic approaches to improve animals will be considered. Technology transfer from laboratory to marketplace will be considered. An understanding of gene mapping, cloning, transfer and expression will be derived. Prerequisite: senior standing or consent of instructor.

**434-2 Physiology of Lactation.** Anatomy and physiology of milk secretion; endocrine control; milk precursors and synthesis; milk composition; physiology and mechanics of milking; lactation-related disorders and diseases; transgenic milk. Prerequisite: course in physiology.

**435-1 to 4 Agricultural Molecular Biotechnology Seminar.** (Same as Plant and Soil Science 435) Molecular biology is rapidly making important contributions to agricultural science through biotechnology. An appreciation of the techniques of molecular biology and their application to plant improvement is important to all in agriculture and biology. The relationships between plant molecular biology and the biotechnology industry will be discussed. Presentations on particular research problems will be made. Graded *S/U*.

**455-2 Animal Waste Management.** Acquaints the student with the scope and problems involved with animal waste management, current regulations and laws on environmental protection. Principles covering waste management technology and current livestock waste management systems are presented. Field trips will be scheduled. Prerequisite: junior standing.

**465-4 Swine Management.** Swine production systems and management techniques including breeding and selection, reproduction, nutrition, herd health and disease prevention, housing and waste management, marketing, production costs and enterprise analysis. Field trip. Prerequisite: 315 and 332 or consent of instructor.

**485-4 Beef Cattle Management.** Beef cattle production systems and management, breeding and selection, reproduction, nutrition and herd health with emphasis on the most economical and efficient systems. Field trip. Students enrolled will incur field trip expenses of approximately \$5. Prerequisite: 315 and 332 or consent of instructor.

**500-3 Research Methods in Agricultural Science.** Experimental design and biometry as applied to biological and allied fields. Prerequisite: graduate student.

**506-3 Instrumentation Methods in Agricultural Science.** Basic methods and techniques of spectrophotometric and chromatographic instrumentation are taught in the lectures with application of instruments carried out in the laboratories. Prerequisite: consent of instructor.

**515-3 Energy and Protein Utilization.** Energy and protein utilization including digestion, absorption and metabolism as related to domestic animal production. Prerequisite: Chemistry 344 and 345.

**516-3 Minerals and Vitamins in Animal Nutrition.** Basic and applied principles of mineral and vitamin metabolism. Emphasis on metabolic functions, reaction mechanisms and interrelationships. Prerequisite: Chemistry 344 and 345.

**531-1 to 6 (2,2,2) Advanced Animal Physiology.** Advanced Physiological concepts as they relate to mammalian systems—subjects covered are: **(a)** advanced reproductive physiology **(b)** developmental physiology **(c)** endocrine physiology. Prerequisite: 331 or an approved course in systemic physiology.

**581-1 to 2 (1,1) Seminar.** Problems relating to various phases of animal industries. Maximum of one hour per semester.

**588-1 to 8 International Graduate Studies.** University residential graduate study program abroad. Prior approval by the department is required both for the nature of the program and the number of credit hours.

**590-1 to 3 Readings in Animal Science.** Reading in specialized fields under direction of approved graduate specialists.

**593-1 to 3 Individual Research.** Investigation of a problem in animal science under the supervision of an approved graduate specialist.

**599-1 to 6 Thesis.** Credit is given for a Master's thesis when it is accepted and approved by the thesis committee.

**601-1 per semester Continuing Enrollment.** For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

## FOOD AND NUTRITION

### COLLEGE OF AGRICULTURAL SCIENCES

**Ashraf, Hea-Ran Lee**, Professor, Ph.D., Iowa State University, 1979; 1980. Food science, food technology.

**Banz, William J.**, Associate Professor, Ph.D., University of Tennessee, 1995; 1995. Human nutrition, nutritional physiology.

**Endres, Jeannette M.**, Professor, Ph.D., St. Louis University, 1972; 1975. Community nutrition, dietetics, life cycle nutrition.

**Girard, T.C.**, Associate Professor, M.S., University of Wisconsin-Stout, 1992; 1993. Hospitality and tourism.

**Harper, Jenny M.**, Professor, *Emerita*, Ph.D., Cornell University, 1941; 1958.

**Higginbotham, Allan**, Assistant Professor, Ph.D., Auburn University, 2001; 2002. Nutritional endocrinology, community nutrition.

**Kim, Kyungmi**, Assistant Professor, Ph.D., Virginia Tech, 2002. Hospitality and Tourism Management.

**Konishi, Frank**, Professor, *Emeritus*, Ph.D., Cornell University, 1958.

**Kroening, Gilbert H.**, Professor and *Dean Emeritus*, Ph.D., Cornell University, 1965; 1969. Monogastric nutrition.

**Long, Sara**, Professor, Ph.D., Southern Illinois University Carbondale, 1991; 1990. Clinical dietetics.

**Welch, Patricia K.**, Professor and *Chair*, Ph.D., Southern Illinois University Carbondale, 1982; 1974. Community nutrition, food service management.

The Department of Animal Science, Food and Nutrition offers a graduate program leading to the Master of Science degree in Food and Nutrition with 2 concentration options: *community nutrition* and *nutritional sciences*. For program details not included in this description, dietetics students may visit the dietetic internship site at <http://www.siu.edu/departments/coagr/animal/dietetic/grad>.

Other students should go to <http://www.siu.edu/~animal>.

#### Admission

A grade point average of 3.0 or higher (4.0= A) and a score of 1000 or higher on the combined verbal and quantitative portions of the Graduate Record Examination are recommended for program entrance. Students should submit a statement of career goals and interest in completing the master's degree, as well as 3 letters of recommendation from former professors or employers.

#### Community Nutrition Concentration

The *community nutrition* curriculum incorporates the public health nutrition knowledge and skills criteria of the Association of Graduate Programs in Public Health Nutrition, Inc. Students complete an accredited dietetic internship that qualifies them to take the registration examination for dietitians. Accreditation is from the Commission on Accreditation for Dietetics Education-CADE-of The American Dietetic Association, 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995. In addition to admission requirements above, students need a Verification Statement for having completed (or "Intent to Complete") a CADE-accredited Didactic Program in Dietetics issued by the program director.

#### Nutritional Sciences Concentration

Students applying to the *nutritional sciences* concentration are expected to have an undergraduate degree in biological sciences, such as nutrition, physiology, zoology, or a related field. Students are also expected to have strong academic and analytical skills.

#### Program Completion Requirements

Unless otherwise stated, the policies of the University and of the Graduate School shall establish the minimum requirements for retention in and graduation from the program. This includes a minimum grade point average for graduation of 3.0 (4.0 point scale).

Both concentrations require 12 to 16 credit hours from the following: FN 581-2, EPSY 506-4, EPSY 508-4 or WED 561-3, FN 599-6, or FN 593-3. The graduate advisor helps students select an additional 14 to 18 credit hours of graduate coursework appropriate for their concentration. For students in Community Nutrition an additional 9 credit hours (FN 580 A, B, C) is required for the accredited dietetic internship.

The thesis or research paper committee is composed of at least 2 departmental faculty members and one faculty member from outside of the department. Master's degree candidates must pass a comprehensive oral examination conducted by their committee, covering all graduate work including thesis or research paper.

#### Courses (FN)

**410-3 Nutrition Education.** Course provides principles, techniques and evaluation methods necessary to incorporate food and nutrition into the educational curriculum of schools, hospitals, out-patient clinics and health agencies. Prerequisite: 321 or equivalent.

**420-3 Recent Developments in Nutrition.** Critical study of current scientific literature in nutrition. Prerequisite: 320 or equivalent.

**421-2 Recent Trends in Food.** Critical study of current scientific literature in food. Prerequisite: 320 or equivalent.

**425-3 Biochemical Aspects of Human Nutrition.** The interrelationship of cell physiology, metabolism and nutrition as related to energy and nutrient utilization, including host needs and biochemical disorders and diseases requiring specific nutrition therapy or consideration. Prerequisite: 320, Chemistry 140b, Physiology 201 and 209.

**435-3 Hospitality Marketing Management.** This course concentrates on marketing hotels, restaurants and tourism. Problems and characteristics specific to the students will be able to develop a comprehensive strategy for marketing a hospitality operation. The starting point for the hospitality industry will be examined. By the end of the course students will be able to develop a comprehensive strategy for marketing a hospitality operation. The starting point for the development of hospitality marketing strategy assumes basic marketing knowledge has been derived from completing a previous marketing course. Prerequisite: 202 or 302 and Marketing 304.

**440-3 Hospitality Risk Management.** Introduction to risk management, security, liability and contact management applicable to the awareness and/or operations of hotel, restaurants and resorts. Prerequisite: specialization in hospitality and tourism, 202, Management 304 or consent of instructor.

**460-4 Food Service Management.** The course includes practical experience in the operational administration of a food service facility. Provides students an opportunity to exercise their ability and creativity to manage a noon luncheon service for the Student Center Old Main Room. The lab involves situations in which students fill the different roles involved with food service management. Lab fee: \$30. Prerequisite: specialization in hospitality and tourism. 202, 360, 373 or consent.

**461-3 Service Organization and Management.** Managerial aspects of the hospitality industry as related to provision of quality service. Organizational structures, management techniques, decision-making abilities, ethics, leadership and human resource issues are examined. Prerequisite: 202, 380, Management 304 and Psychology 323 or consent of instructor.

**470-5 Medical Nutrition Therapy.** In-depth study of pathophysiology and principles of medical nutrition therapy for various disease states. Application of these principles also prerequisite. Off-campus experience may be required. Prerequisite: 320, 321, Health Care Professions 105, Chemistry 140b, Physiology 201 and 209 or equivalent.

**473-3 Hotel Administration.** An advanced hotel administration course covering contemporary management issues such as conference management, hotel security, strategic planning, and hotel law. Prerequisite: specialization in hospitality and tourism, 302, 372, Management 304 or consent of instructor.

**475-3 Nutrition Through the Life Cycle.** The study of human nutrition during each phase of the life cycle, prenatal through geriatric. Students elect at least two phases for in-depth study. A general review of basic nutrition is included. Prerequisite: 320 or equivalent.

**480-3 Community Nutrition.** Offers a study of the objectives, implementation strategies, and evaluation methods of nutrition programs in communities' health programs. Integration of nutrition into the health care delivery system at local, state and federal levels is included. Prerequisite: 472

**485-3 Advanced Nutrition.** This course applies advanced principles of biochemistry and physiology to expand on basic nutrition information and explains the role of nutrients from cellular and mechanistic aspects. Prerequisite: 320, 425 or equivalents.

**530-3 Advanced Nutritional Assessment and Education.** Community assessment methods, specifications or particular tools used and how these tools can be applied to particular conditions of concern in community nutrition. The methods of education for individuals and populations using dietary, biochemical, anthropometrics and physical assessment data will be taught. Prerequisite: 321 or consent of instructor.

**540-3 Nutrition Policy, Programs and Services.** The study of policies, programs and services concerned with prevention and treatment of nutrition problems in the population. Prerequisite: 480 and consent of instructor.

**574-3 Advanced Medical Nutrition Therapy.** In depth study of the application of nutrition to the management of disease states with emphasis on current treatment and complex metabolic abnormalities. Prerequisite: 470 or equivalent.

**580-9 (3,3,3) Nutrition Practicum in the Community.** Designed to provide practicum experiences in dietetics for students completing the Master's in Food and Nutrition and includes (a) clinical rotation, (b) management rotation, (c) public health nutrition rotation. Prerequisite: 585 and consent of instructor.

**581-1 Seminar.** An integration of the knowledge gained from the didactic and experiential learning prior to and after the clinical, food service and public health field experiences. Prerequisite: 480 and consent of instructor.

**585-3 Advanced Community Nutrition.** A presentation and examination of issues and programs in food and nutrition programs. Elements including the organization and management of quality nutrition services for the prevention of disease and promotion of health will be identified and applied to community programs. Prerequisite: 480 or consent of instructor.

**590-1 to 3 Reading in Food and Nutrition.** Individual readings in food and nutrition under graduate faculty guidance. Prerequisite: consent of instructor.

**593-1 to 3 Individual Research.** Investigation of a problem in food and nutrition under the supervision of an approved graduate faculty member. Graded S/U only.

**599-1 to 6 Thesis.** Credit is given for a Master's thesis when it is accepted and approved by the thesis committee. Graded S/U only.