AVIATION SYSTEMS
(UT Space Institute)
http://www.utsi.edu/Academic/AvSys/index.html
Ralph D. Kimberlin, Chairman

Professor
Kimberlin, R. D., PhD ................................................... RWTH (Germany)

Associate Professors
Richards, R.B., MS ....................................................... New Jersey
Solies, U. P., (Liaison), PhD ............................................ Tennessee

Research Assistant Professor
Ranaudo, R.J., MS ........................................................ Ohio

Emeriti Faculty
Collins, F. G., PhD ....................................................... California
Mason, A. A., PhD ....................................................... Tennessee
Paludan, C. T., PhD .................................................... Denver
Wu, J. M., PhD ........................................................ Cal Tech
Young, R. L., PhD ....................................................... Northwestern

MAJOR DEGREE
Aviation Systems ....................................................... MS

The University of Tennessee Space Institute offers a program leading to the Master of Science degree with a major in aviation systems. The aviation systems program is designed for those who possess a bachelor’s degree in engineering or science and wish to study under a system philosophy toward careers in research and development or administration in areas pertinent to aviation. Current emphases include flight testing, aircraft design, aviation meteorology, air traffic control, and airport management.

ADMISSION
To qualify for admission to this program, the applicant must possess a bachelor’s degree in engineering or science from an accredited institution, show evidence of ability to pursue and benefit from the program, and fulfill the University of Tennessee, Knoxville, graduate admission procedures and grade point standards. It is expected that the student will have a basic knowledge of computer utilization and statistics; an understanding of aerodynamic fundamentals, aircraft propulsion, and performance; and some understanding of economics.

MASTER OF SCIENCE Aviation Systems Major

Both thesis and non-thesis programs are available. The thesis program involves a minimum of 30 hours credit while the non-thesis program involves a minimum of 33 hours credit. Both options are fully supported off-campus utilizing electronic media for videotaping and interactive distance teaching methods.

REQUIREMENTS
Thesis Option

The thesis program involves satisfactory completion of the following requirements:

Research and Development Specialization
• Twelve hours of 500-level courses in the major field of aviation systems
• Six hours in industrial engineering (engineering management)
• Six hours of electives from the major field, mathematics or engineering
• Six hours of Aviation Systems 500 demonstrating the ability to conduct and report on an independent investigation
• Defense of thesis and completion of final exam

Administration Specialization
• Twelve hours of 500-level courses in the major field of aviation systems
• Three hours in industrial engineering (engineering management)
• Three hours in economics or finance
• Six hours of electives selected from the major field, mathematics or engineering
• Six hours of Aviation Systems 500 demonstrating the ability to conduct and report on an independent investigation
• Defense of thesis and completion of final exam

Non-Thesis Option
The non-thesis program will be permitted in special circumstances and involves satisfactory completion of the following requirements:

Research and Development Specialization
• Twelve hours of 500-level courses in the major field of aviation systems
• Six hours in industrial engineering (engineering management)
• Twelve hours of electives in the major field, mathematics or engineering
• Three hours of an assigned project under Aviation Systems 550
• A comprehensive final written examination on all coursework submitted for the degree and defense of the project course paper

Administration Specialization
• Twelve hours of 500-level courses in the major field of aviation systems
• Three hours in industrial engineering (engineering management)
• Three hours in economics or finance
• Twelve hours of electives in the major field, mathematics or engineering
• Three hours of an assigned project under Aviation Systems 550
• A comprehensive final written examination on all coursework submitted for the degree and defense of the project course paper

GRADUATE COURSES
Aviation Systems (169)

500 Thesis (1-15) P/NP only.

501 Aviation Systems: An Overview (3) Aviation systems, present and future. Socioeconomic base, aerospace and propulsion technology, meteorology, air traffic control, airport community interface, and technological trends and developments pertinent to present status and future development of air transportation.


550 Project in Aviation Systems (3) Enrollment limited to aviation system students in non-thesis program. May be repeated. Maximum 3 hours allowed toward degree.

COMPARATIVE AND EXPERIMENTAL MEDICINE

http://www.vet.utk.edu/graduate

Robert N. Moore, Director and Graduate Liaison

Joint Graduate Coordinating Committee

Bartrig, J.W., DVM, PhD, Veterinary Teaching Hospital
Ichiki, A.T., PhD, Medical Biology
Lawler, J. E., PhD, Psychology
Lozzio, C., M.D., Medical Genetics
Moore, R.N., PhD, Veterinary Teaching Hospital

MAJOR DEGREES

Comparative and Experimental Medicine ............................................. MS, PhD

Comparative and Experimental Medicine (MS and PhD) is a jointly-administered graduate program intended to prepare students for teaching and/or research careers in the health sciences. This program emphasizes the comparative approach to the study of experimental pathobiology, infectious diseases, pharmacokinetics, epidemiology, clinical medicine, immunopathology, hematology, aberrant metabolism, oncology, and genetic disorders. The PhD program is open to approved graduate students seeking training in this area and is especially useful for individuals with professional degrees. For the student with undergraduate biological science background, the comparative and experimental medicine program provides an unusual opportunity to study disease processes common in humans and animals from a multidisciplinary perspective. The scope of this intercollegiate program, which pools faculty resources from both veterinary and human medicine, is broadened by faculty members representing animal science and numerous areas of the life sciences. The interdisciplinary training environment includes such diverse support as facilities and personnel at the Veterinary Teaching Hospital, the University of Tennessee Medical Center at Knoxville, the Oak Ridge National Laboratory, and departments of life sciences.

For additional information, write to the Office of Research and Graduate Programs, or access the Web site.

MASTER OF SCIENCE

Comparative and Experimental Medicine Major

ADMISSION

Admission requirements of the Graduate Council of the University of Tennessee, Knoxville, apply. In addition, all applicants must furnish three letters of recommendation from individuals who are familiar with their scholastic or professional records.

Applicants must have a baccalaureate degree with coursework in chemistry through organic, mathematics through calculus, physics, and basic biology. More advanced study in biology such as biochemistry, mammalian anatomy, histology, cell biology, or other appropriate biomedical courses from an accredited university is recommended.

Applicants for admission to the Master of Science degree program whose background include no formal training in the biomedical field beyond the baccalaureate degree will be required to score at least 1,000 on the quantitative and verbal portions of the Graduate Record Examination.

REQUIREMENTS

Core courses are required for the program. A basic science and/or applied science concentration must be selected at the first meeting of the student’s master’s committee.

- Basic science concentration: Students must take at least 4 credit hours in 500- or 600-level courses in basic mechanisms of disease and at least 6 credit hours of 500-level biochemistry or cell biology. See listings under the Biochemistry and Cellular and Molecular Biology program for information on these courses.

- Applied science concentration: Students must take at least 6 credit hours of 600-level epidemiology and at least 5 credit hours of 500- or 600-level statistics.

In addition, students must complete a minimum of 8 hours of coursework in a specified discipline, 5 or more hours of electives, and 6 hours of Thesis 500. Exceptions to accommodate students with specific interests must be approved by the Joint Graduate Coordinating Committee after application, in writing, to the director.

The graduate committee (at least 3 members) is chosen after the first term and must include at least one member from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine. If a minor is declared, one member must be from the minor discipline.

A final oral examination is given at the end of the program.

DOCTOR OF PHILOSOPHY

Comparative and Experimental Medicine Major

ADMISSION

Admission requirements of the Graduate Council of the University of Tennessee, Knoxville, apply. In addition, all applicants must furnish three letters of recommendation from individuals who are familiar with their scholastic or professional records.

Applicants generally will be expected to have a professional degree in one of the medical sciences (e.g., MD, DDS, DVM) or a master’s degree in one of the biomedical sciences and a Graduate Record Examination score of at least 1000 for the quantitative and verbal sections.

An individual having a baccalaureate degree with a strong background in the physical and biological sciences may be admitted upon presenting evidence of exemplary performance on the Graduate Record Examination.

Exceptional veterinary students at the University of Tennessee, Knoxville, may be admitted to the comparative and experimental medicine graduate program but will be enrolled officially as veterinary students. During summers such students may take advantage of registering for graduate courses to be counted as elective courses in the veterinary program.
REQUIREMENTS

Core courses are required for the program. A basic science and/or applied science concentration must be selected at the first meeting of the student’s doctoral committee.

• Basic science concentration: Students must take at least 4 credit hours in 500- or 600-level courses in basic mechanisms of disease and at least 6 credit hours of 500-level biochemistry or cell biology. See listings under the Biochemistry and Cellular and Molecular Biology program for information on these courses.

• Applied science concentration: Students must take at least 6 credit hours of 600-level epidemiology and at least 5 credit hours of 500- or 600-level statistics.

In addition, students must complete a minimum of 8 hours of coursework in a specified discipline. Exceptions to accommodate students with specific interests must be approved by the Joint Graduate Coordinating Committee after application, in writing, to the director. Areas of emphasis may include hematology, oncology, comparative pathology, comparative pharmacology, toxicology, immunology, genetics, infectious disease or biochemistry of diseases.

At least 24 hours of coursework, including a minimum of 6 hours at the 600 level, and 24 hours of Dissertation 600 are required for a total of 48 hours. For students with professional degrees, a minimum of 18 hours of coursework beyond the professional degree is required for a total of 42 hours.

The doctoral committee (at least 4 members) is chosen during the first year. Three of the four members, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine.

A comprehensive examination is given at the completion of coursework. A seminar and final oral defense of the dissertation culminate the program.

GRADUATE COURSES

Comparative and Experimental Medicine—Veterinary School of Medicine (262)

Participating departments include: Anesthesia, Medicine, Medical Genetics, Obstetrics and Gynecology, Pathology, Pediatrics, Radiology, and Surgery.

500 Thesis (1-15) P/NP only.

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. Satisfactory/No Credit grading only.

500 Graduate Research Participation (3) Advanced research techniques while conducting individual biomedical research projects under supervision of faculty. Open to all graduate students. Prereq: Consent of instructor. May be repeated with consent of instructor. Maximum 9 hours. Satisfactory/No Credit grading only.

541 Molecular Basis for Human Diseases (4) Disease at molecular level. Changes in molecular events in cells that lead to disease and occur as result of disease. Correlation with clinical and pathological states. Prereq: Biochemistry and Cellular and Molecular Biology 410-419 or equivalent.

545 Clinical Genetics (3) Human genetic disorders: new developments in cytogenetics, molecular genetics, clinical diagnoses and prevention. Prereq: Biology and genetics background or consent of instructor.

600 Doctoral Research and Dissertation (3-15) P/NP only.

610 Medical Biology Seminar (1) Invited speakers. Topics posted in advance. May be repeated. Satisfactory/No Credit grading only.

611 Advanced Topics in Medical Science (1-3) New developments in biological research applicable to clinical medicine. Primarily for doctoral candidates in Comparative and Experimental Medicine. Prereq: Consent of instructor. May be repeated. Maximum 6 hours.

Comparative and Experimental Medicine—Veterinary Medicine (261)

Participating departments include: Animal Science, Comparative Medicine, Microbiology, Pathology, Large Animal Clinical Sciences and Small Animal Clinical Sciences. Several faculty in the Department of Microbiology hold joint appointments in the College of Veterinary Medicine. See Microbiology for additional courses.

500 Thesis (1-15) P/NP only.

501 Special Topics in Comparative and Experimental Medicine (1-6) Specialized experience in comparative and experimental medicine. Prereq: Consent of instructor. May be repeated. Maximum 6 hours.

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. Satisfactory/No Credit grading only.

503 Predictive Toxicology (3) Principles and techniques of predictive toxicology: structure-activity relationships, expert systems, neural nets and molecular similarity.

510 Laboratory Animal Care and Use (2) Review of basic laboratory animal care and use as prerequisite to conducting research using animal subjects. Prereq: Consent of instructor. May be repeated. Maximum 4 hours.

530 Wildlife Diseases (2) (Same as Wildlife and Fisheries Science 530.)

561 Pharmacology (4) Principles of pharmacokinetics and pharmacodynamic properties of drugs: mode of action, pharmacologic effects, chemical and physical properties, metabolism, toxicities, important idiosyncrasies and clinical applications. Prereq: Consent of instructor.

600 Doctoral Research and Dissertation (1-15) P/NP only.

602 Surgical Pathology (1-2) Examination of biopsy specimens and interpretation of observations. Preparation of specimens for sectioning. Prereq: Consent of instructor. May be repeated. Maximum 3 hours.

603 Correlative Post-Mortem Pathology (1-3) Gross and microscopic post-mortem examination of animals. Correlative interpretation of clinical diseases and lesions. Prereq: Consent of instructor. May be repeated. Maximum 6 hours.

604 Veterinary Pathology Seminar (1) Microscopic slides and transparencies of lesions from cases examined by pathologists, residents, and graduate students. Interpretation of observations. Prereq: Consent of instructor. May be repeated. Maximum 4 hours.

605 Pathobiology Seminar (1) Subjects of current interest in biomedical science. Students present one seminar per term enrolled. Prereq: Consent of instructor. May be repeated. Maximum 4 hours. Class meets once monthly.

606 Clinical Epidemiology (3) Theory and principles of design implementation and analysis of clinical research. Lab: appraisal of biomedical literature and design of proposal for clinical research project. Prereq: Consent of instructor. May be repeated. Maximum 3 hours.

607 Diagnosis and Pathogenesis of Virus Diseases of Domestic Animals (3) Advanced study of virus diseases important to domestic animals: virus biology, pathogenesis, pathology and diagnosis technical training in virus diseases diagnosis. Prereq: Consent of Instructor. 2 hours and 1 lab.

608 Descriptive and Applied Epidemiology (3) Principles of epidemiology and historic and modern application to diseases of animals. Host-agent relationships, measurement of disease frequency, animal production and disease monitoring and control, field investigations, animal health economics. Prereq: Consent of instructor.

609 Mechanisms of Disease (4) Advanced topics in pathobiology and mechanisms of disease: pathophysiology, cellular degeneration, inflammation, immunopathology, hemostasis. Principal biochemical and morphologic responses of various cells, tissues, and organs to injury and other metabolic derangements. Selected contemporary topics from current literature and textbooks. Prereq: Consent of instructor.

610 Advanced Topics in Comparative and Experimental Medicine (1-3) Specialized in-depth experience in various disciplines. Current and future research methodology, recent advanced in instrumentation in analytical techniques for comparative medicine. Prereq: Consent of instructor. May be repeated. Maximum 12 hours.

651 Advanced Topics in Animal Anatomy (1-4) (Same as Animal Science 651.)

652 Disorders of the Endocrine System (2) (Same as Animal Science 652.)