Graduate Student Handbook

Comparative and Experimental Medicine

an intercollegiate graduate program at the University of Tennessee, Knoxville

2024-2025 Academic Year

Table of Contents

WELCOME

Welcome to the Comparative and Experimental Medicine (CEM) graduate program. We are excited that you are interested in this unique multi-disciplinary graduate program at the University of Tennessee (UT), Knoxville. We offer both Master of Science (MS) and Doctor of Philosophy (PhD) degrees which prepare students for careers in the health sciences. Students can take either non-thesis or thesis MS degree options. We also have the option for students to take the PhD with a concurrent MS degree. Together with the Doctor of Veterinary Medicine (DVM) program, we offer an accelerated dual degree program leading to the conferral of both DVM and PhD degrees in less time than would be required to both degrees independently. This dual DVM-PhD program prepares students for careers in research. We also offer a dual DVM-MS option that leads to conferral of both DVM and MS degrees in less time than would be required for the two degrees taken independently. Our program actively promotes the concept of "One Health, One Medicine" by emphasizing the comparative approach to the study of biomedical science. We have recently extended this by offering a One Health minor that is available to students from all programs and colleges of the University of Tennessee, Knoxville.

The CEM program is open to graduate students seeking biomedical training and provides an opportunity for a multi-disciplinary approach to study health issues in animals and humans while also considering their environment. This intercollegiate program involves participation of faculty with a wide-range of interests in biomedical disciplines and life sciences. The interdisciplinary training environment provides our students access to facilities, faculty, and other personnel from the College of Veterinary Medicine, UT Medical Center at Knoxville, life sciences departments, Herbert College of Agriculture, College of Engineering, College of Nursing, the Department of Nutrition, and the Department of Public Health.

It is my hope that you will find this handbook useful if you are planning to pursue or are already pursuing a graduate degree in Comparative and Experimental Medicine. It contains basic information about policies and procedures in the graduate program, including curricula and degree completion requirements. We update this document periodically in light of changes instituted by the program or other administrative units.

If you would like to be involved with the program as a student, collaborator, faculty, or sponsor, please do not hesitate to contact us at the address on the next page.

Agricola Odoi, BVM, MSc, PhD, FAHA, FACE, Dipl. AVES
Professor and Assistant Dean for Research & Graduate Studies

"We are committed to supporting the creation of equitable and inclusive spaces for students, faculty, and staff, with a focus on removing structural barriers and fostering an atmosphere in which every member of the campus community matters and belongs. We work to advance access, accountability, an inclusive campus climate, and equity while combating racism, bias, and discrimination." UT Division of Diversity and Engagement

INTRODUCTION

In order to serve the mission and vision of the Graduate School and preserve the integrity of graduate programs at the University of Tennessee, Knoxville, information related to the process of graduate education in each department is to be provided for all graduate students. Based on best practices offered by the Council of Graduate Schools, it is important that detailed articulation of the information specific to the graduate degrees offered in each department/program be disseminated. The Comparative and Experimental Medicine (CEM) Graduate Student Handbook does not deviate from established Graduate School policies noted in the Graduate Catalog but rather provides the specific ways in which those policies are carried out.

Purpose of the Handbook

The purpose of this handbook is to provide detailed information to graduate students and faculty on the degree program requirements, policies, and procedures within the CEM graduate program. Graduate students are expected to be aware of and satisfy all regulations governing their work and study at UT. More information on university regulations can be found in the Graduate Catalog, *Hilltopics* student handbook, and Graduate Council Appeal Procedure.

Contact Information

CEM Program Office
A205 Veterinary Medical Center
2407 River Drive
Knoxville, TN 37996-4553
865-974-0227

Website: https://vetmed.tennessee.edu/research/cem-graduate-program/

CEM Program Director

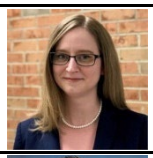
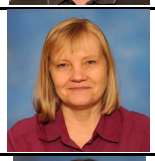
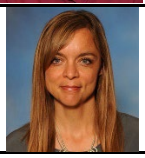
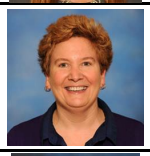
Dr. Agricola Odoi Professor and Assistant Dean for Research and Graduate Studies
aodoi@utk.edu

CEM Program Coordinator

Morgan Tolbert
Administrative Assistant for Research and Graduate Studies
mtolber4@utk.edu

CEM Graduate Faculty

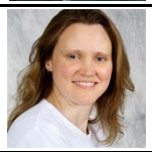
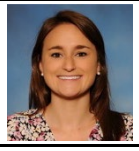
Biomedical and Diagnostic Sciences

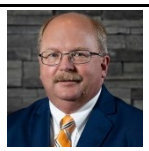
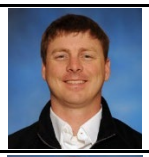
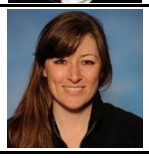
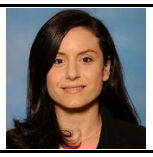
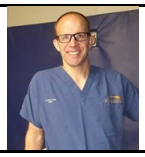
	**Dr. Misty Bailey** mmcginn2@utk.edu	Veterinary medical education, survey research, educational assessment, student evaluations of teaching	Teaching
	**Dr. Tim Chamberlain** tchamb11@utk.edu	Gross anatomy of domestic, wild, and exotic species; Osseous and vascular 3D segmentation; Clinical anatomy; Public health in austere environments	Committee Membership
	**Dr. Sherry Cox** scox6@utk.edu	Clinical and collaborative research with a special interest in analytical analysis and drug pharmacokinetics.	Committee Membership
	**Dr. Michelle Dennis** mdenni12@utk.edu	Pathogenesis and diagnosis of natural disease, with special interest in aquatic animals and wildlife	Mentorship Teaching Committee Membership
	**Dr. Kellie Fecteau** kfecteau@utk.edu	Endocrinology, diagnostic testing procedures, diagnostic endocrinology in exotic species, hyperadrenocorticism in animals	Teaching Committee Membership
	**Dr. Bente Flatland** bflatlan@utk.edu	Clinical pathology; laboratory quality assurance and quality control; method validation and verification	Teaching Committee Membership
	**Dr. Richard Gerhold** rgerhold@utk.edu	Wildlife, livestock, public health-associated disease epidemiology; climate change and parasites, protozoa and tick-borne diseases, neuroinvasive parasites, avian diseases with a particular interest in Histomonas, Trichomonas, and coccidia	Mentorship Teaching Committee Membership
	**Dr. Luca Giori** lgiori@utk.edu	All aspects of laboratory medicine (hematology, biochemistry, cytology, and quality assurance) with a specific passion in endocrine and metabolic diseases and related diagnostics	Mentorship Teaching Committee Membership
	**Dr. Sarah Linn-Peirano** slinn2@utk.edu	Urinary tract infection innate immunity; antimicrobial peptide production and regulation; bacterial and viral host-pathogen interaction	Mentorship Teaching Committee Membership

Biomedical and Diagnostic Sciences

	**Dr. Jennifer Lord** jlord1@utk.edu	Quantitative and spatial epidemiology; health disparities; social drivers/determinants of health; preventable hospitalizations; antimicrobial resistance	Mentorship Teaching Committee Membership
	**Dr. Michael Mahero** mmahero@utk.edu	Qualitative and quantitative epidemiology in One Health, vector borne diseases, control of zoonoses and environmental hazards along the human-animal-wildlife interface, biosecurity and veterinary public health	Mentorship Teaching Committee Membership
	**Dr. Dennis Makau** dmakau@utk.edu	Harnessing big data and machine learning for disease dynamics and management in human-livestock ecosystems; advancing sustainable livelihoods and population health through data-driven policies	Mentorship Teaching Committee Membership
	**Dr. Debra Miller** dmille42@utk.edu	Amphibian diseases; Leatherback sea turtle health. Secondary research interests: Other wildlife and fish health studies	Mentorship Teaching Committee Membership
	**Dr. Girish Neelakanta** gneelaka@utk.edu	Microbiology, Vaccines, Infectious diseases, Anaplasmosis, Rickettsiosis, Cell signaling, Metabolism, Proteomics, Transcriptomics, Genomics, miRNAs, ticks, Immunization, Bacteria-host-tick interactions	Mentorship Teaching Committee Membership
	**Dr. Agricola Odoi** aodoi@utk.edu	Geographic Information Systems (GIS) and spatial epidemiology; Health Disparities; Determinants of health; Impacts of place on health outcomes and access to health services	Mentorship Teaching Committee Membership
	**Dr. Chika Okafor** okaforch@utk.edu	Qualitative and quantitative epidemiology in One Health; antimicrobial use/resistance patterns in veterinary medicine; bovine anaplasmosis; safety of foods of animal origin	Mentorship Teaching Committee Membership
	**Dr. Sree Rajeev** srajeev@utk.edu	Leptospira and Leptospirosis- Epidemiology and pathogenesis, Antigen discovery and development of vaccines and diagnostics for infectious diseases. (Leptospira, Anaplasma, Ehrlichia)	Mentorship Teaching Committee Membership
	**Dr. Robert Reed Jr** rbreed@utk.edu	Effectiveness of veterinary simulation models in veterinary education, gross anatomy of domestic species, gross anatomy of exotic species	Committee Membership
	**Dr. Jacquline Risalvato** jrisalva@utk.edu	Antibody and epitope mapping for infectious disease responses, vaccine platform development for infectious diseases, poultry and avian pathogen diagnostic testing surveillance and development	Mentorship Teaching Committee Membership

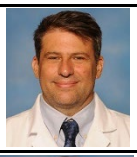
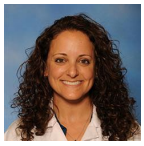
Biomedical and Diagnostic Sciences

	**Dr. Barry Rouse** btr@utk.edu	Immune mechanisms and pathogenesis and control of infectious diseases of man and animals	Mentorship Teaching
	**Dr. Deanna Schaefer** dschaefe@utk.edu	Hematopathology; comparative hematology; iron metabolism and deficiency	Teaching Committee Membership
	**Dr. John Schaefer** jschaef6@utk.edu	Diagnostic parasitology and acarology	Committee Membership
	**Dr. Wesley Sheley** wsiniard@utk.edu	Wildlife diseases with a specific interest in amphibians	Teaching Committee Membership
	**Dr. Nora Springer** nspringer@utk.edu	The effect of obesity on adipose stem cells in cancer development and for regenerative medicine; Genetic and microenvironmental drivers of hematopoietic neoplasia (lymphoma and leukemia)	Mentorship Teaching Committee Membership
	**Dr. Hameeda Sultana** hsultana@utk.edu	Arthropod-derived exosomes in mediating flavivirus transmission, vector-borne viral diseases involving flaviviruses; mosquito-borne dengue, Zika, West Nile virus, tick-borne Langat and Powassan viruses, neuronal exosomes, neuroinvasive diseases and viral caused neuropathogenesis, identifying and characterizing novel therapeutic agents or targets to treat pan-flaviviral infections in humans and animals	Mentorship Teaching Committee Membership
	**Dr. Sharon Thompson** srthompson@utk.edu	Food safety and defense	Committee Membership

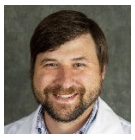
	**Dr. Henry S. Adair** sadair@utk.edu	Equine musculoskeletal conditions, regenerative medicine and equine rehabilitation	Mentorship Teaching Committee Membership
	**Dr. David E. Anderson** dander48@utk.edu	Orthopedics, tissue regeneration, use of animal models to advance animal and human health, biomedical science, biotechnology, biomechanics, biometrics	Mentorship Teaching Committee Membership
	**Dr. Marc Caldwell** mcaldwell@utk.edu	Infectious diseases of food animals with particular focus on bacterial pathogenesis and host-pathogen interactions	Mentorship Teaching Committee Membership
	**Dr. Elizabeth Collar** ecollar@utk.edu	Equine and translational investigations into osteoarthritis and subchondral bone disease, sport and race horse health issues, and minimally invasive surgery	Mentorship Teaching Committee Membership
	**Dr. Madhu Dhar** mdhar@utk.edu	Mechanobiology, translatable to human and veterinary medicine. Understanding of mesenchymal stem cells' response to nanoparticles; to predict and control cell fate in tissue culture and in animal models	Mentorship Teaching Committee Membership
	**Dr. Chiara E Hampton** champ14@utk.edu	Clinical pharmacology, pharmacokinetic-pharmacodynamic integration, swine as animal model and patient, xenotransfusion to pigs	Teaching Committee Membership
	**Dr. Andrea Lear** alear@utk.edu	Reproductive and placental immunology in ruminants and their use as translational models, with an emphasis of infectious disease during pregnancy, non-invasive diagnostic development, and associated neonatal outcomes of compromised pregnancy	Mentorship Teaching Committee Membership
	**Dr. Pierre-Yves Mulon** pmulon@utk.edu	Biomechanics, bone healing, regenerative medicine, bone implant interface, osseointegration	Mentorship Teaching Committee Membership
	**Dr. Tulio Prado** tprado@utk.edu	Large animal reproductive efficiency with emphasis on food animal production medicine. General animal reproduction including companion animals, lamoids, and equine	Mentorship Teaching Committee Membership
	**Dr. M. Reza Seddighi** mrsed@utk.edu	Pharmacokinetics and pharmacodynamics of analgesics and anesthetics, Potency of inhalational anesthetics (MAC), Partial Intravenous Anesthesia (PIVA), Analgesia and Pain management	Committee Membership

Large Animal Clinical Sciences

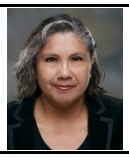
	**Dr. Joe Smith** jsmit604@utk.edu	Clinical pharmacology, specifically pharmacokinetic-pharmacodynamic integration, simulation, and modeling, as well as the pharmacology of analgesics, proton pump inhibitors, and antimicrobial resistance	Mentorship Teaching Committee Membership
	**Dr. Tena Ursini** tursini@utk.edu	Biomechanical analysis of motion, assessing quality of motion in response to therapy or intervention (motion capture, inertial motion units, electromyography) using clinical and translational models, sports medicine, rehabilitation and recovery	Mentorship Teaching Committee Membership
	**Dr. Brian Whitlock** bwhitloc@utk.edu	Reproductive neuroendocrinology and neuroinflammation, use of animal models of advanced human health (e.g. traumatic brain injury, disease induced neuroinflammation, depression), biomedical science, and biotechnology	Mentorship Teaching Committee Membership

	**Dr. Cassio Ferrigno** cferrign@utk.edu	Bone healing, biomechanical testing, new implants for fracture repairs, Contact mechanics, Small Animal orthopedic	Mentorship Committee Membership
	**Dr. Ashley Hartley** ahartle2@utk.edu	Small animal infectious diseases, with emphasis on canine and feline protozoal, vector-borne, and fungal diseases	Mentorship Teaching Committee Membership
	**Dr. Liza Köster** lkoster@utk.edu	Novel echocardiographic indices; acquired and congenital cardiac disease; biomarkers in heart disease	Mentorship
	**Dr. Darryl Millis** dmillis@utk.edu	Canine gait analysis; osteoarthritis; stem cell and platelet-rich plasma therapies; canine physical rehabilitation; rehabilitation modalities including extracorporeal shockwave and laser; effects of growth factors on bone healing	Mentorship Teaching Committee Membership
	**Dr. Maryanne Murphy** mmurph30@utk.edu	Obesity prevention and management; nutritional management of gastrointestinal disorders; veterinary nutrition education	Mentorship Teaching Committee Membership
	**Dr. Angela Rollins** arollins@utk.edu	Canine and feline obesity	Mentorship Teaching
	**Dr. Julie Sheldon** jsheldo3@utk.edu	In addition to practicing at local zoos and sanctuaries, Dr. Sheldon contributes to assessments of remote wildlife populations including Peruvian vampire bats and marine life, and currently studies health of black bears in Tennessee.	Mentorship Teaching Committee Membership
	**Dr. Karen Tobias** ktobias@utk.edu	Improving outcomes of surgery	Mentorship Teaching

University of Tennessee, Knoxville Graduate School of Medicine

	**Dr. Manasi Balachandran** mbalachandran@utmck.edu	Amyloidosis & Cancer Theranostics, Immunology, Biomedical-Clinical-Translational Research	Mentorship Teaching Committee Membership
	**Dr. Oscar Grandas** ograndas@utmck.edu	Vascular Surgery, Dialysis Access, Kidney Transplantation	Committee Membership
	**Dr. Eric Heidel** rheidel@utmck.edu	Applied Biostatistics and Epidemiology	Teaching Committee Membership
	**Dr. Joseph Jackson** jwjackson@utmck.edu	Cancer Immunology, Innate Immunology, Oncolytic viral vector development, Amyloidosis, Development of translation therapies to enhance amyloid phagocytosis	Mentorship Teaching Committee Membership
	**Dr. Michael Karlstad** mkarlsta@utmck.edu	Nutritional modification of the inflammatory response in acute lung injury. Pancreatic islet cell inflammatory responses in Type I and II diabetes	Committee Membership
	**Dr. Deidra Mountain** dmountain@utmck.edu	Vascular biology and vascular pathogenesis; Development and design of translational nanotherapeutics for gene therapy applications in vascular disease	Mentorship (full) Teaching Committee Membership
	**Dr. Jon Wall** jwall@utmck.edu	Amyloidosis, immunotherapy, and translational medicine	Mentorship Teaching Committee Membership

Cooperating Departments Outside of UTCVM

	**Dr. Cristina Barroso** cbarroso@utk.edu	Maternal and child health, health equity, chronic disease prevention and control, childhood obesity, healthy eating, active living, and body image	Mentorship (full)
	**Dr. Doris D'Souza** ddsouza@utk.edu	Rapid detection & tracking systems for foodborne bacterial and viral pathogens in the food environment to prevent outbreaks and recalls and novel intervention strategies to control their spread in human and pet food production systems	Committee Membership
	**Dr. Rebecca Trout-Fryxell** rfryxell@utk.edu	Surveying vector populations and assessing pathogen prevalence; ascertaining specific biologies and life histories of vectors by population, species, and/or community; investigating population specific vector ecology and genetics	Committee Membership

CEM STANDING COMMITTEES

Admissions and Academic Progress Committee (AAPC)

The AAPC develops and applies standards for admitting and retaining well-qualified students who will benefit from graduate education, advance the interests of the degree program, and likely make important contributions to biomedical science. The specific responsibilities of the AAPC include:

- Annually review program-specific admissions requirements.
- Review student applications and make admission recommendations to the MS, DVM-MS, PhD and DVM-PhD CEM programs.
- Review student annual progress reports and make decisions regarding necessary corrective actions, probation,or dismissal from the program.

AAPC Members


Chair: Agricola Odoi


Ex Officio: David Anderson


SACS: Maryanne Murphy


LACS: Joe Smith


BDS: Hameeda Sultana

Curriculum Committee (CC)

The CC represents the CEM faculty. The purpose of the committee is to develop and maintain a curriculum and standards for performance evaluation that facilitate the training of scientists fully prepared for careers in biomedical science. The specific responsibilities of the CC include:

- Perform an annual evaluation of the curriculum by examining individual course content, catalog descriptions, and core course requirements. Identify curricular redundancies and deficiencies.
- Consider requests for new courses and present requests to CEM faculty for approval.
- Identify courses not taught in four or more years, identify reasons for this hiatus, and either vote to remove the course from the catalog or seek CEM faculty input/participation to reengage the course.
- Establish syllabus requirements.
- Recommend examination formats and procedures for comprehensive examinations and thesis and dissertation defenses.

CC Members


Chair: Agricola Odoi


Ex Officio: David Anderson


SACS: Darryl Millis


LACS: Madhu Dhar


UTGSM: Jon Wall


BDS: Michael Mahero

ADMISSION REQUIREMENTS

Admission Types

UT offers several admission types. When applying to the Graduate School, students need to be certain they understand which type of admission applies to their situation. More detail is provided on the Graduate Admissions webpage and in the Graduate Catalog. Regardless of type, all applicants must apply through the Office of Graduate Admissions.

- **Degree** – for those pursuing a graduate or professional degree.
- **Non-degree** – for those interested in taking graduate courses but not in a particular degree program.
- **Graduate Certificate** – for those pursuing a graduate certificate.
- **Transient** – for those enrolled in a graduate program at another institution and wishing to use UT classes intheir program of study.
- **Postdoctoral** – for those holding a doctoral degree who wish to continue taking graduate courses.
- **Faculty and Staff** – for members of the faculty or staff located in Knoxville.
- **English Proficiency Conditional** – for degree-seeking international graduate students who have not satisfied the English certification requirement.
- **Change of Program** – for currently enrolled graduate students seeking a change of major, concentration, degree, campus location, or delivery mode; or moving from non-degree to degree seeking (or vice-versa).
- **Readmission** – for graduate students with an interruption in enrollment who seek readmission.

Requirements for Admission to the CEM Master of Science Degree Program

Applicants to the MS degree program must have a baccalaureate degree with coursework in chemistry, including organic; mathematics, including 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. The CEM Program does not require students to take the GRE.

Requirements for Admission to the CEM Doctor of Philosophy Degree Program

Applicants generally will be expected to have

- a professional degree from an accredited institution in one of the medical sciences (e.g., DVM, MD, DDS)

OR

- a master's degree in one of the biomedical sciences

An individual having only a baccalaureate degree, with a strong background in the physical and biological sciences, may be admitted to the PhD program upon presenting evidence of exemplary experience.

Requirements for Admission to the CEM Dual DVM/MS and Dual DVM/PhD Program

Students who meet the minimum requirements for admission to the CEM program need to identify a major professor who will sponsor them before full admission to the program will be considered. Participating graduate faculty are listed in this handbook. The major professor advises the student about courses, supervises the student's research, and facilitates communication within the CEM program.

Application Procedures

Please review the following information carefully as success of your application will depend on submission of the following materials to the Office of Graduate Admissions. More detailed instructions on the application process are provided by the Office of Graduate Admissions.

Graduate Application Form

1. Create your account on Slate, our online application system, and begin completing the admission application.
2. Select Bredesen Center and Comparative and Experimental Medicine as your college.
3. Select your degree, master's or doctoral.
4. Select your program and entry term.

Selection of a Major Professor

Students who meet the minimum requirements for admission to the CEM program need to identify a major professor who will sponsor them before full admission to the program will be considered. Participating graduate faculty are listed in this handbook. The major professor advises the student about courses, supervises the student's research, and facilitates communication within the CEM program.

Transcripts

For the application, you are required to submit your transcripts from **ALL** former schools. For the initial application, you can submit unofficial transcripts. Documents uploaded with your application are not considered official. The University of Tennessee, Knoxville does not consider transcripts that come from applicants or that have been in the applicant's possession as official.

After admission, you will submit official transcripts. Official transcripts must be received before the student will be allowed to register for a second term. The preferred method of delivery is electronic submission of official transcripts over a secure network from a service such as Parchment, National Clearing House, Digitary, or your institution's electronic delivery system. If using one of these services, please have transcripts delivered to gradtranscripts@utk.edu.

If you are a current or former student at the University of Tennessee, Knoxville, you do not need to upload a copy of your transcript. Our office will be able to access your transcript. However, you must include the University of Tennessee, Knoxville in the colleges/universities you list on your application.

Visit the Graduate School Transcripts information page for more information on transcript requirements.

GRE Scores

The GRE is not required for entry into the CEM program.

Letters of Recommendation (3)

You will be required to list three references on your application who will be able to assess your previous academic and/or research experience and ability to succeed in graduate studies. References will fill out the online recommendation form produced when that portion of your online application is completed.

Application Fee

Pay the non-refundable $60 application fee by credit/debit card.

International Student Admission Requirements

The University welcomes applications for admission from all countries and encourages students to examine and compare the many educational opportunities available at the University of Tennessee. If you are an applicant from a country other than the United States, there are a few requirements that you should be aware of, with respect to deadlines, admission requirements, English-language certification, and costs. All international students must complete the requirements listed on the previous page 5. International students have additional requirements for their application and admission.

International Student GPA Requirement

For admission to a graduate program, an international student must have an equivalent 4-year bachelor's degree. Individuals with degrees from foreign institutions must have earned a minimum of 3.0 on a 4.0 scale on all undergraduate work and a minimum of 3.3 on a 4.0 scale on all graduate work. US degree holders must have earned a minimum 2.7 out of a possible 4.0 GPA or a minimum of 3.0 during the senior year of undergraduate study and a minimum of 3.0 on a 4.0 scale on all graduate work.

English Language Certification

An applicant requesting admission to the Graduate School may be required to submit results of the TOEFL (Test of English as a Foreign Language) or the International English Language Testing System (IELTS). Find out how to register for the TOEFL or the IELTS.Minimum score requirements for admission to the Graduate School are:

- a total score of 80 on the internet-based TOEFL (iBT),
- a 6.5 overall band score on the IELTS.

The scores will be considered valid if submitted with the application within two (2) years of the test date. An applicant may be exempted from the English Certification requirement if:

- English is an official language in the applicant's country of citizenship, according to standards published by the Graduate School. *Applicant is exempted when indicating citizenship is in a country in which English is an official language*.
  OR
- English is the primary language of instruction at the institution in which the applicant received an undergraduate, graduate, or professional degree.
- After taking your exam, have your scores sent to the University of Tennessee, Knoxville. If you have taken the TOEFL, please use the institution code of 1843.

Transcript Submission from Non-US Institutions

Please see the information below on how to submit your academic documentation based on their country of origin.
English translations are required for any and all documents not already in English.

If your country is not listed here, please contact the Office of Graduate Admissions for information pertaining to your country. Review the information on how to submit your academic documentation based on your country of origin.

If you are having transcripts sent by mail, please use the following address:

The University of Tennessee, Knoxville
Office of Graduate Admissions
201 Student Services Building
Knoxville, TN 37996-0221
USA

International Student Application Deadline

All international applicants intending to enroll with VISA types F and J must follow the deadlines below. International applicants intending to enroll with other VISA types may be eligible to apply after the deadlines noted below and should contact the Office of Graduate Admissions for more information.

There are two deadlines for each term. The first deadline is when the initial application must be submitted online. By the file completion deadline, admission must be granted and all documents required to obtain a student visa must be submitted to the Center for Global Engagement.

Term of Entry	Application Deadline	File Completion Deadline
Fall	February 1	May 15
Spring	June 15	October 1
Summer	October 15	February 15

For more information on international student admissions requirements, please contact the Graduate School via their contact form.

FINANCIAL SUPPORT

Assistantships and Fellowships

The College of Veterinary Medicine offers a limited number of graduate research assistantships within the CEM program. This and other methods of support may be arranged with individual faculty. Successful pairing with a major professor does not guarantee funding support.

Graduate Research Assistantships

Assistantships are awarded as funds are available. Persons with a professional degree in the health sciences who wish to pursue a PhD program are given priority. Awards are renewable up to 4 years for the PhD and up to 2 years for the MS. Awards typically include a stipend, tuition waiver, and health insurance.

How to Apply: Requests must come through the major professor addressed to the Director of Graduate Studies.

Notification of Award: Awardees are notified by a letter from the Director of Graduate Studies.

Requirements for Maintaining an Assistantship

- Students holding a one-half time (20 hours per week) assistantship normally should enroll in at least 6 credit hours during the semesters of the assistantship. A one-fourth time (10 hours per week) graduate assistant normallyshould enroll in at least 9 credit hours during the semesters of the assistantship. A student must be enrolled in at least 9 credit hours to be considered full-time for federal financial aid purposes, even if the student has an assistantship. Summer enrollment must be at least 3 credit hours in order to maintain student health insurance.

  For **international students**, the minimum enrollment may be different. International students should always check with the Center for Global Engagement to determine the number of credit hours needed to satisfy the requirements of their specific visa.

- Students must make timely and satisfactory progress as described in the Degree Requirements and Academic Standing sections of this handbook.
- Assistantships are not automatically renewed. Funding assistance is dependent on the availability of funds and satisfactory performance of the student's assigned duties. Students must submit a yearly progress report to the Director of Graduate Studies each academic year. In cases where corrective measures must be taken to remediate deficiencies, the CEM program will follow procedures as outlined in the Policy for the Administration of Graduate Assistantships in the Graduate Catalog.
- Instances in which a graduate assistant wishes to take a leave of absence will be handled on a case-by-case basis between the student, the student's major professor, the CEM program office, and the Graduate School. No guarantee can be made that a student's position will be available upon their return. A Leave of Absence Form must be filled out and submitted to the Graduate School for approval.

Workload for an Assistantship

As student employees, graduate assistants are balancing professional development through work experience with progress toward their degree. To encourage that balance, the workload for an assistantship may not exceed 20 hours per week without prior approval from the Dean of the Graduate School. Appointments are normally on a one-half time (20 hours per week) or one-fourth time (10 hours per week) basis. However, the normal number of hours for conducting an assignment should be mutually understood by the student and the major professor.

Graduate School Fellowships

The Graduate School offers and administers various fellowships. These awards are for full-time study at UT and awardees are selected on the basis of high achievement, broad intellectual ability, and potential for significant career contributions. Students do not apply for fellowships; they are nominated by the department. More detailed information can be found on the Graduate Fellowships webpage.

Other Types of Financial Aid

Information on other types of financial aid is available at One Stop Student Services:

- Grants
- Scholarships
- Work–Study
- Loans
- Study Abroad
- Summer
- Consortium Agreements

Fee Deferment of Veterans Education Benefits

Service members, veterans, and dependents of veterans who are eligible beneficiaries of United States Department of Veterans Affairs Education Benefits may elect, upon formal application, to defer payment of required tuition and fees until the final day of the term for which the deferment has been requested. Instructions for requesting a fee deferment can be found on the Veterans Success Center website under VA UTK Enrollment Information/Fee Deferment.

Student Health Insurance

Student health insurance is available for purchase by graduate students who do not have a graduate assistantship. All students are subject to minimal eligibility requirements set forth by the insurance company. The student health insurance covers most medical costs provided by the Student Health Center at 100%. Off campus, it functions as a comprehensive health plan subject to deductibles, co-pays, and co-insurance. Students not otherwise covered by insurance are urged to purchase this or another comparable plan, since paying for medical care is the student's responsibility.

Enrollment in the student insurance plan is **mandatory** for international students. Fees are charged to their MyUTK account. International students may waive the cost of UT insurance if they have already purchased insurance before arriving in the United States, as long as it meets the university-mandated criteria.

All graduate assistants on at least a one-fourth time (10 hours per week) appointment are automatically enrolled in the Graduate Assistant Health Insurance Program. These students will have 100% of the premium paid by the university. If students already have insurance coverage through another insurance carrier, this policy functions as additional coverage.

GSS Travel & Academic Support Awards

The Graduate Student Senate (GSS) administers travel and academic support awards for graduate students attending professional meetings. These awards are based on both need and merit and help defray expenses for transportation, lodging, and registration fees.

To request a travel award, students must complete an online application. All applications require electronic signatures from the advisor/major professor, department head, and college dean and must be submitted no later than 5 p.m. on the day of the deadline.

If you have any questions about the travel award application process, please contact gsstravel@utk.edu.

REGISTRATION AND ADVISING

The minimum number of credit hours for registration is 1 credit hour (for students who must register for course 600 Dissertation, the minimum is 3 credit hours). Registration allows use of services such as library checkout, laboratories, and recreation facilities not open to the public.

Information concerning registration is available on the One Stop Student Services webpage. Registration is accomplished via the web through the MyUTK student portal (you will be asked to log in using your UT NetID and password).

Payment of Registration Fees

During priority registration, students receive an email at their UT email address indicating their payment statement is available for viewing at MyUTK. Payment is due by the deadline stated. A graduated late fee is assessed to any student who fails to register during priority registration. Additional information can be obtained at One Stop Student Services.

Failure to pay required fees before the deadline for the semester will result in the student being dropped from all courses. Students may not attend and credit cannot be earned for classes without proper enrollment registration.

Change in Registration (Adds, Drops, Withdrawals)

The permanent record will show all courses for which the student has registered, except those audited and those from which the student has withdrawn on or before the "Drop Course without a W" deadline. A student who fails to attend the first class meeting, without prior arrangement with the instructor, may be dropped from the course to make space available to other students. However, it is the student's responsibility to assure that a course has been dropped; otherwise, a grade of F will be received for the course.

If a student drops **all** courses for the semester, that is considered Withdrawing from the University. Students called to active military duty during enrollment should contact the Veterans Success Center for assistance with withdrawal and readmission procedures.

Type of Change for Full Term Classes (fall/spring)	Deadline
Add or Drop a course without a W or change credit/grading	1st thru 10th day of class
Add a course or change credit/grading with instructor/advisor permission	11th thru 42nd day of class
Drop a course with a W	11th thru 84th day of class

For summer semester, the periods for add, drop, change of credit/grading are determined based on a percentage of the equivalent deadline for a full semester.

Within the change of registration period, a student may change registration on MyUTK. If the deadline has already passed, the student must submit a Late Change of Registration Form to the Graduate School, with approval from the course instructor and the Director of Graduate Studies.

Registration deadlines for a given semester can be found under **Timetable/Financial Deadline Calendars** on the Office of the University Registrar website.

500- and 600- Level Course Distinction

Graduate courses offered through the CEM graduate program provide information and training at both fundamental and advanced levels. Offerings at the fundamental level present information and challenges for which the foundations have been set at the undergraduate level. In the CEM, these courses are listed as 500-level courses. CEM courses listed at the 600 level are advanced presentations based on foundations provided at the 500 level and lower.

500-level

Course description: Information presented in these courses is foundational for the disciplines represented in comparative and experimental medicine. Courses at this level may be core courses for both MS and PhD programs and may be required by student committees for both MS and PhD curricula.

These courses are typically lecture-based with examinations as the grading mechanism; however, grading may also be

based on written papers and oral presentations. Credit hours are based on contact hours with students. As examples, a 1-credit-hour course must meet the equivalent of one 50-minute session per week during a semester whereas a 4-credit course must meet the equivalent of 4 sessions per week (2,800 minutes) during a 14-week semester.

Faculty: The responsible faculty member must be at the rank of assistant professor or above, and all invited lecturers must have at least a master's degree or professional medical degree (DVM, MD, DDS, or equivalent).

600-level

Course description: Information presented in these courses is advanced beyond the fundamental information presented in courses at the 500 level. Courses at the 600 level may be presented in traditional or non-traditional formats, including interactive and group or individual learning activities. Depending on the course format, grading may be based on examinations, written papers, oral presentations, or defined participation.

Course credit is determined from a combination of lectures, group learning activities, and interactive and individualized learning activities.

Faculty: The responsible faculty member must be at the rank of assistant professor or above and must have previously taught in at least one graduate-level course (500-level graduate course or 800-level veterinary course).

Special and Advanced Topics and Variable Credit Courses

The CEM offers different courses titled as either special or advanced topics. These courses are individualized to meet specific needs of students. Credit hours are variable, and the courses may be repeated with different subject matter. Approval to offer special and advanced topics courses must be requested prior to the semester in which the course is proposed to be offered. CEM faculty should submit requests to the Director of Graduate Studies using the Course Request Form, accompanied by a course syllabus.

Proper Use of Courses 502 and 500/600

Course 502: Use of Facilities is for students who are not taking coursework and do not wish to register for thesis or dissertation hours. Registering for this course will permit borrowing privileges in the UT Libraries or use of computer labs, other labs, and other university resources. **NOTE: Credit hours taken in course 502 may not be used toward degree requirements.**

Course 500 Thesis is for the master's-level student working on a thesis. Six credit hours of course 500 Thesis must be taken for the degree, and students must register for course 500 each semester during work on the thesis. At least 3 credit hours of course 500 must be taken during the semester in which the student plans to graduate.

Course 600 Dissertation is for the doctoral-level student working on a dissertation. Twenty-four credit hours of course 600 Dissertation must be taken for the degree, and students must register for course 600 when work toward the dissertation begins. **Continuous registration** of at least 3 credit hours in course 600 (including summer semester) is required thereafter until graduation.

Full-Time Status

The maximum load for a graduate student is 15 credit hours during fall and spring semesters. While 9 credit hours are considered full time, the typical full academic load varies by discipline. For the summer semester, graduate students may register for a maximum of 12 credit hours in an entire summer semester.

Students holding a one-half time (20 hours per week) are required to enroll in at least 6 credit hours during the semesters of the assistantship. **A student must be enrolled in at least 9 credit hours to be considered full-time for federal financial aid purposes, even if the student has an assistantship**.

Registration for more than 15 credit hours during any semester, or for more than 12 credit hours in the summer semester, is not permissible without prior approval. Students wishing to take course hours beyond the standard credit hours for a single term must obtain approval from their major professor and must submit a Permission to take a Graduate Course Overload Form to the Director of Graduate Studies.

CEM Course Listings

CEM students are not restricted to registration only within the CEM course listings and are expected to enroll in courses outside the program.

Codes for course offerings:

*E – **every** semester*
*FA – **fall** semester only*
*SP – **spring** semester only*
*SU – **summer** semesteronly*
*Alt – **alternate** years*
*Even – **even-numbered years** (e.g., 2022)*
*Odd – **odd-numbered years** (e.g., 2021)*

411 – Undergraduate Research Participation (1-3). Experience in active biomedical research projects under supervision of faculty. Students in pre-medicine, biology, and related majors may conduct research projects within designated areas. Satisfactory/ No Credit grading only. May be repeated with consent. Maximum 9 credit hours. Contact coordinator prior to registering. E

500 – Thesis (1–15). P/NP only. E

501 – Special Topics in Comparative and Experimental Medicine (1–6). Specialized experience in comparative and experimental medicine. May be repeated. Maximum 12 credit hours. Consent of instructor. E

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. Satisfactory/No Credit grading only. May be repeated. May not be used toward degree requirements. E

504 – Descriptive and Applied Epidemiology (3). Principles of epidemiology as well as historic and modern applications to human and animal diseases. Host-agent relationships, measurement of disease frequency, disease monitoring and control in human and animal populations, field investigations, animal health economics and production. FA

506 – One Health (3). Will address the link between human, animal, and environmental health. Each online module focuses on some aspect of "One Health" and may include topics such as emergency preparedness, zoonotic diseases, antibiotic resistance and food safety, responsible pet ownership and the human-animal bond, and the effects of climate on disease prevalence. Methods of intervention and problem solving such as research design, program evaluation, community education, and policy analysis are also incorporated. This is an online course. SU

507 – Epidemiology of Vector-Borne, Bacterial, and Viral Zoonotic Diseases (3). Emphasis is placed on understanding the host, agent, and environmental factors that determine the distribution of selected diseases of importance to both human and animal populations. Selected topics include vector-borne zoonoses, rabies, brucellosis, and psittacosis. This is an online course. Recommended Background: Public health, veterinary medicine, nursing courses, or students in these programs. Comment(s): Graduate or professional veterinary students at UTK and personnel employed by the Tennessee Department of Health and enrolled in the Applied Epidemiology Certificate Program. Consent of instructor. SU–Odd

508 – Epidemiology of Parasitic, Foodborne, and Bacterial Zoonotic Diseases (3). Emphasis is placed on understanding the host, agency, and environmental factors that determine the distribution of diseases of importance to both human and animal populations. Selected topics include anthrax and leptospirosis, in addition to parasitic and foodborne zoonoses. This is an online course. Consent of instructor. SU–Even

510 – Graduate Research Participation (1-3). Advanced research techniques while conducting individual biomedical research projects under supervision of faculty. May be repeated. Maximum 12 credit hours. Consent of instructor. E

515 – Current Topics in Comparative and Experimental Medicine (1–6). Specialized experience in comparative and experimental medicine. May be repeated. Maximum 12 credit hours. Consent of instructor. E

525 – Research Ethics for the Life Sciences (1). Cross-listed: (Plant Sciences 525). How good research conduct and knowing the rules of science can enable success in life science research. Bioethics is not a focus. FA

530 – Wildlife Diseases (2). Cross-listed: (Wildlife and Fisheries Science 530). Necropsy of birds and mammals. Recognition of various diseases and methods of preparing pathological materials in field and lab. Investigative procedures concerning wildlife diseases. FA–Even

531 – Wildlife Medicine: Conservation and Policy (2-3). Cross-listed: (Veterinary Medicine 875). Both online and in-person study abroad components. The online portion of the course will explore policy and economics of wildlife medicine as well as address human health concerns in developing nations. A clinical component abroad will allow students to learn to handle and treat medical and surgical conditions in wild animals. Students must satisfactorily complete online modules and associated assignments, participate in didactic and clinical activities while abroad, and write a reflective paper upon completion of the course. Contact Hour Distribution: 1 hour online, 1–2 hours off campus. Grading Restriction: Satisfactory/No Credit grading only. Repeatability: May be repeated. Maximum 6 credit hours. Comment(s): Veterinary Medicine students may count the course only once (either 2 or 3 credit hours) toward degree requirements. Registration Permission: Consent of instructor. SP

541 – Cellular and Molecular Basis of Disease (3). Disease at the molecular level. Changes in molecular events in cells that lead to disease and occur as a result of disease. Correlation with clinical and pathological states. Systems covered: neurological, structural, respiratory, circulatory, metabolic, endocrine, reproductive, and immunological. Prerequisite: Biochemistry and Cellular and Molecular Biology 419, or equivalent. FA

544 – Cancer Cell Biology (3). Comprehensive discussion of the major mechanisms of cancer initiation, promotion, and progression. Emphasizes experimental approaches, signaling pathways, technology, and animal models that are employed to study cancer. Students are expected to learn about common laboratory techniques in cancer research, apoptosis/cell cycle, and the following as they relate to cancer: alternative splicing, signaling pathways, inflammation, chemo/dietary prevention, animal models, pathobiology, PET/CT imaging, genetics, lipids, radio-oncology, metastasis/angiogenesis, and obesity. Recommended background: Advanced biology, including cell biology, molecular biology, biochemistry, microbiology, or genetics. FA–Odd

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

601 – Advanced Epidemiology (3). Epidemiological study design, data analysis, and model building. Emphasis placed on using, understanding, and making inferences based on least squares, logistic, Poisson, survival, and mixed models. STATA will be used as the basic computing language for all analyses. Recommended Background: Graduate-level epidemiology or statistics course. SP–Odd

602 – GIS and Geographical Epidemiology (3). Principles and applications of Geographical Information Systems (GIS) and geographical epidemiology in human and animal health research and practice. Exposure to a wide range of spatial analysis techniques useful in the investigation of human and animal disease problems as well as vector dynamics. The knowledge gained is useful in guiding disease prevention and control strategies. Recommended Background: Graduate-level epidemiology or statistics course. SP–Even

603 – Advanced Veterinary Hematology (1-2). Topics related to veterinary hematology at an in-depth level. The 1-credit-hour class consists of weekly discussions on a specific hematology topic. The 2-credit-hour class includes a second weekly session for microscopic evaluations of blood smears and bone marrow slides. May be repeated. Maximum 4 credit hours. Consent of instructor. SP

604 – Principles of Comparative Pharmacokinetics (3). Addresses the fundamental principles of absorption, distribution, metabolism, and elimination of xenobiotics in animals and humans. Quantitative aspects will include basic study design as well as mathematical modeling of plasma concentration vs time data. Hands-on sessions will include basics of pharmacokinetics and modeling, case studies in clinical patients, bioequivalence studies, pharmacokinetic linearity, and the effect of factors on the fate of chemicals in the body of animals and humans. 2 hours and 1 lab. Recommended background: Previous academic exposure in physiology, biostatistics, or mathematical modeling. Consent of instructor. FA

605 – Resident Systems Seminars (1). Topics related to the various body systems or to medical information systems, including Oncologic, Cardiovascular, Musculoskeletal, Dermatologic, Endocrine, Digestive, Urinary, Ophthalmologic, Infectious, Respiratory, Nutritional, Neurologic, Reproductive, and Statistics and Writing. May be repeated. Maximum 12 credit hours. Recommended background: Professional degree. Consent of instructor. E

606 – Advanced Large Animal Internal Medicine (2). Topics related to large animal internal medicine, including basic physiology, pathophysiology, and systems-based coursework. May be repeated. Maximum 8 credit hours. Recommended background: Professional degree. Consent of instructor. FA, SP

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. 2 hours and 1 lab. Consent of instructor. SU–Alt

610 – Advanced Topics in Comparative and Experimental Medicine (1–3). Specialized, in-depth experience in various disciplines. Current and future research methodology, recent advances in instrumentation in analytical techniques for comparative medicine. May be repeated. Maximum 12 credit hours. E

611 – Journal Club in Emerging Infectious Diseases (1). Readings and discussions based on current literature. May be repeated. Maximum 12 credit hours. FA, SP

612 – Journal Club in Biomedical and Diagnostic Sciences (1). Readings and discussions based on current literature. May be repeated. Maximum 12 credit hours. E

613 – Journal Club in Large Animal Clinical Sciences (1). Readings and discussions based on current literature. May be repeated. Maximum 12 credit hours. E

614 – Journal Club in Small Animal Clinical Sciences (1). Readings and discussions based on current literature. May be repeated. Maximum 12 credit hours. Must have DVM or equivalent degree. E

615 – Journal Club in Comparative and Experimental Medicine (1). Readings and discussions based on currentliterature. May be repeated. Maximum 12 credit hours. E

616 – Comparative and Experimental Medicine Seminar (1). Research seminars pertinent to disciplines within the program. Satisfactory/No Credit grading only. May be repeated. Maximum 12 credit hours. Maximum 3 credit hours may be applied toward degree requirements. FA, SP

617 – Medical Biology Seminar (1). Invited speakers. Topics posted in advance. Satisfactory/No Credit grading only. May be repeated. Maximum 12 credit hours. Maximum 3 credit hours may be applied toward degree requirements. FA, SP

618 – Advanced Topics in Medical Science (1-3). New developments in biological research applicable to clinical medicine. May be repeated. Maximum 12 credit hours. Primarily for doctoral candidates in Comparative and Experimental Medicine. Consent of instructor. E

620 – Current Topics in Comparative and Experimental Medicine (1–3). Specialized, in-depth experience in various disciplines, such as current and future research methodology, and recent advances in instrumentation in analytical techniques for comparative medicine. May be repeated. Maximum 12 credit hours. E

652 – Disorders of the Endocrine System (2). Cross-listed: (Animal Science 652). Pathological and physiological aspects of diseases; endocrine glands of various animal species. Recommended Background: 3 credit hours of physiology. SP

DEGREE REQUIREMENTS

Master of Science

14 credit hours in **Core Coursework***

- *CEM 504 Descriptive and Applied Epidemiology **(3 credit hours)**
- *CEM 541 Cellular and Molecular Basis of Disease **(3 credit hours)**
- *CEM 616 Comparative & Experimental Medicine Seminar **(1 credit hour)**
- *Journal Clubs 500- or 600-level **(4 credit hours)**
- *Statistics 500- or 600-level **(3 credit hours)**

10 credit hours in Graduate Coursework (level 500 or above)

- **8** of those credit hours in Research Emphasis Area.
- The research emphasis area may include epidemiology, imaging, immunology, infectious diseases, medicine, molecular and cellular biology, nutrition and metabolism, oncology, parasitology, pathology, pharmacology, regenerative medicine and tissue regeneration, surgery, or toxicology. Exceptions to accommodate students with interests not listed above **must be approved** by the Director of Graduate Studies after application, in writing. The purpose of the research emphasis area is to focus the student's final examination.
- **2** of those credit hours in Electives

6 credit hours in CEM 500 (Thesis Option)

OR

6 credit hours in CEM 501/510/515 (Course Only with Comprehensive Exam Option)

30 credit hours total

400-level courses: A maximum of 6 credit hours at the 400 level (in which **graduate** credit is offered) may be counted toward candidacy. **In order to receive graduate credit**, students must select "graduate" level upon registration AND inform the course instructor on or before the first day of class that graduate credit is being sought. Course requirements for graduate credit will be more rigorous and will exceed the expectations for undergraduates. Petitions for retroactive changing of undergraduate to graduate credit will not be accepted.

Credits earned in Non-Degree status: No more than 15 credit hours of graduate coursework taken at UT in non-degree status may be applied toward a graduate degree. For candidacy, any credits earned in non-degree status **must be approved** by both the student's major professor and the Director of Graduate Studies. Courses applied toward the degree must also fall within the specified time limit.

Transfer credits: A majority of the total credit hours required for a master's degree must be taken at UT. Official transcripts from all institutions previously attended must be sent directly to the Graduate School before any credit will be considered. Courses transferred will not be counted in determining the student's grade-point average. Credits transferred from universities outside the UT system cannot be used to meet thesis requirements or 600-level coursework requirements. Credit for extension courses taken from other institutions is not transferable, nor is credit for any course taken at an unaccredited institution. No graduate credit is accepted for work done by correspondence study. Transferred courses must have been completed within the 6-year period prior to receipt of the degree. The courses must be listed on the Admission to Candidacy Application and will be placed on the student's UT transcript only after admission to candidacy.

Degree Time Limit

Master's students have **six calendar years** to complete the master's degree, starting with the semester of the first course counted toward the degree. Students who change degree programs during this 6-year period may be granted an extension after review and approval by the Dean of the Graduate School. In any event, courses used toward a master's degree must have been taken within six calendar years of graduation.

Additional Requirements

UTCVM Research Day: Master's students are required to present at least once in the annual UTCVM Research Day event.

Progress Report: Students who have been in the program for at least two semesters are required to complete a yearly progress report, which is completed each summer. More details are listed on page 33 of this handbook.

Responsible Conduct of Research Training: All students must complete an approved responsible conduct of research training program by the end of their 3rd semester. More details are listed on page 33 of this handbook.

Master's Committee

The master's committee is composed of the student's major professor and at least two other faculty members, all at the rank of assistant professor or above. At least one faculty member must be from the College of Veterinary Medicine (this can include the major professor), and at least one faculty member must be from outside the major professor's academic unit (this external member can be from outside of UT). If the student is pursuing a minor, one faculty member must have expertise in the minor discipline. Following best practices, faculty who have personal relationships that might affect committee functioning (e.g., spouses, family members) may not serve together on master's committees.

After one semester, the student should consult with the major professor concerning the formation of the master's committee. **By the end of the second semester, the master's committee must be chosen.** The student must submit a Masters Committee Appointment Form, **along with the CVs of any external members**, to the Director of Graduate Studies for approval. The committee will assist the student in planning a program of study, formulating and completing an appropriate research project, developing a thesis or project proposal, and ensuring the achievement of degree requirements. The committee may require and/or recommend specific courses in addition to those required by the program.

The student is responsible for coordinating meetings of the master's committee at least twice per year and obtaining and/or preparing required materials for the meetings, such as appropriate Graduate School forms, transcripts, yearly progress reports, and research proposals. Student progress will be monitored by the Director of Graduate Studies. It is incumbent upon students to promptly honor requests for progress reports.

Admission to Candidacy

A student may apply for candidacy for the master's degree after completing prerequisite courses and at least 9 credit hours of graduate coursework with an overall GPA of 3.00 or higher. All courses for the degree, including transfer coursework, are listed on the Admission to Candidacy Application and submitted to the Graduate School no later than the last day of classes of the semester preceding the semester in which the student plans to graduate. Once approved, any revisions needed to add or remove courses and/or committee members must be done by submitting a Revised Admission to Candidacy-Masters Form.

Thesis Option

Registration in course 500 Thesis

Students register for course 500 Thesis each semester that work is done on the thesis (continuous registration is not required). A minimum of 6 credit hours of 500 Thesis is required for the thesis option, including a minimum of 3 credit hours in the semester in which the thesis is accepted by the Graduate School.

Thesis preparation

The thesis represents the culmination of an original research project completed by the student and is submitted in electronic format to the Thesis Consultant in the Graduate School for examination, final approval, and acceptance. The thesis must be prepared according to the guidelines provided on the Theses and Dissertations webpage, including the requirement to use university-approved plagiarism detection software prior to the defense.

The student schedules the final examination by submitting the Scheduling Defense of Thesis/Project/Capstone Form to the CEM program office. The examination must be held at least two weeks before the final date for acceptance and approval of the thesis by the Graduate School. This is an official university academic activity – pets (with the exception of service animals) and young children are not permitted to attend. Students should not bring refreshments to the defense.

Final Examination (Defense of Thesis)

Candidates must present a thesis seminar and pass a final oral examination. This examination, which covers both coursework and the thesis, measures the candidate's ability to integrate material in the research emphasis area and related fields. A final draft of the thesis must be distributed to all committee members **at least two weeks prior** to the date of the final examination. All committee members must be present for the examination. The Director of Graduate Studies is also invited to attend the oral defense.

Upon successful defense of the thesis, the final electronic copy must be submitted to TRACE (Tennessee Research and Creative Exchange) and must be accompanied by a Thesis/Dissertation Approval Form signed by all members of the master's committee. The approval form certifies to the Graduate School that the committee members have examined the final copy and found that its form and content demonstrate scholarly excellence. An Initial Embargo Request is required if a student would like to request an embargo on their work.

Following the oral defense, the Report of Final Examination must be submitted to the Graduate School by the deadline date for that semester. In case of failure, the student may not apply for re-examination until the following semester. The result of the second examination is final. Information on the appeals process is located in the Grievances and Appeals section of this handbook.

Non-thesis Option (Course Only with Comprehensive Exam)

This non-thesis option would normally be elected by students who desire advanced didactic training at the master's level without performing an extensive research project. It is useful for students employed within the field of biomedical science or engaged in resident training. Students must meet all requirements for the MS degree in CEM.

Final Examination (Seminar and Oral Defense)

In lieu of a thesis, 6 credit hours in CEM 501, 510, or 515 are required in which the student prepares an analytical research paper that thoroughly identifies and explores a scientific, technical, or social science issue associated with the field. **This paper will be presented as a public seminar, followed by an oral comprehensive examination (defense) by the student's committee.**

The student schedules the final examination by submitting the Scheduling Defense of Thesis/Project/Capstone Form to the CEM program office. The examination must be held at least two weeks before the final date to submit the Report of Final Examination to the Graduate School. All committee members must be present for the examination. The Director of Graduate Studies is also invited to attend the oral defense. This is an official university academic activity – pets (with the exception of service animals) and young children are not permitted to attend. Students should not bring refreshments to the defense.

Following the oral defense, the Report of Final Examination must be submitted to the Graduate School by the deadline date for that semester. In case of failure, the student may not apply for re-examination until the following semester. The result of the second examination is final. Information on the appeals process is located in the Grievances and Appeals section of this handbook.

Program Deadlines for Completion of MS Degree

	Year 1			Year 2		
Semester	**Sem. 1**	**Sem. 2**	**Sem. 3**	**Sem. 4**	**Sem. 5**	**Sem. 6**
Entry into program	X					
MS committee approved		X				
Responsible Conduct of Research Training			X			
Submit admission to candidacy form					X	
Thesis/Project credit hours				X	X	X
Final Exam/Thesis Defense						X

* Yearly Progress Report due each summer and 1 UTCVM Research Day Presentation before graduation.
** X indicates the deadline, but these tasks should be completed prior to the deadline.

DUAL DVM-MS

The College of Veterinary Medicine and the CEM program offer a coordinated accelerated dual program leading to the conferral of both the Doctor of Veterinary Medicine and the Master of Science degrees in less time than would be required to earn both degrees independently. This accelerated program is designed for students who wish to obtain advanced research training to complement their veterinary knowledge and clinical skills.

14 credit hours in **Core Coursework***

- *CEM 504 Descriptive and Applied Epidemiology **(3 credit hours)**
- *CEM 541 Cellular and Molecular Basis of Disease **(3 credit hours)**
- *CEM 616 Comparative & Experimental Medicine Seminar **(1 credit hour)**
- *Journal Clubs 500- or 600-level **(4 credit hours)**
- *Statistics 500- or 600-level **(3 credit hours)**

10 credit hours in Graduate Coursework (level 500 or above)

- The CEM program will allow up to **8** of these credit hours to be supplemented with approved **preclinical** courses offered by the College of Veterinary Medicine. These courses must be graded A-F, with an earned grade of at least a B. Courses eligible for dual credit will be at the recommendation of the student's CEM major professor in consultation with the student's master's committee.
- **2** of those credit hours in Electives

6 credit hours in CEM 500 (Thesis Option)

OR

6 credit hours in CEM 501/510/515 (Course Only with Comprehensive Exam Option)

30 credit hours total

Students entering the dual degree program must meet the minimum admission requirements for both the DVM and MS programs. Applicants for the dual program must make separate application to, and be competitively and independently accepted by, the College of Veterinary Medicine for the DVM and the CEM program for the MS. Students who have been **admitted** to the College of Veterinary Medicine may apply for approval to pursue the dual program at any time prior to or after matriculation. Such approval will be granted, provided that dual program studies are started prior to entry into the fourth semester of DVM coursework.

Students enrolled in the dual program will be officially classified as primarily veterinary students until the DVM coursework is completed, with the following exception: dual program students will typically enroll as primarily MS students during the summer semesters following completion of their first and second years in the veterinary curriculum. After the DVM is conferred, the student's primary major will be CEM.

Degrees do not need to be awarded simultaneously. If a dual student has not completed the requirements for the MS, the student may still be awarded the DVM. If the student completes the MS requirements, but does not complete the DVM, the student may still be awarded the MS. Students must satisfy the graduation requirements of each program.

Doctor of Philosophy

16 credit hours in **Core Coursework***

- *CEM 504 Descriptive and Applied Epidemiology **(3 credit hours)**
- *CEM 541 Cellular and Molecular Basis of Disease **(3 credit hours)**
- *CEM 616 Comparative & Experimental Medicine Seminar **(1 credit hour)**
- *Journal Clubs 500- or 600-level **(6 credit hours)**
- *Statistics 500- or 600-level **(3 credit hours)**

8 credit hours in in Research Emphasis Area.

- The research emphasis area may include epidemiology, imaging, immunology, infectious diseases, medicine, molecular and cellular biology, nutrition and metabolism, oncology, parasitology, pathology, pharmacology, regenerative medicine and tissue regeneration, surgery, or toxicology. Exceptions to accommodate students with interests not listed above **must be approved** by the Director of Graduate Studies after application, in writing. The purpose of the research emphasis area is to focus the student's final examination.

****24** credit hours of graduate coursework. A minimum of 6 credit hours must be must be taken in UT courses at the 600 level (exclusive of course 600 Dissertation), and at least 12 credit hours must be graded A-F.
24 credit hours of course CEM 600 Doctoral Research and Dissertation.

Students with a master's or professional degree: 72 hours total

Students **without** a master's or professional degree:
****48** credit hours of graduate coursework. A minimum of 6 credit hours must be must be taken in UT courses at the 600 level (exclusive of course 600 Dissertation), and at least 24 credit hours must be graded A-F.

Students without a master's or professional degree: 96 credit hours total

400-level courses: A maximum of 6 credit hours at the 400 level (in which **graduate** credit is offered) may be counted toward candidacy. **In order to receive graduate credit**, students must select "graduate" level upon registration AND inform the course instructor on or before the first day of class that graduate credit is being sought. Requirements for these courses will be more rigorous and will exceed the expectations for undergraduates. Petitions for retroactive changing of undergraduate to graduate credit will not be accepted.

Credits earned in Non-Degree status: No more than 15 credit hours of graduate coursework taken at UT in non-degree status may be applied toward a graduate degree. For candidacy, any credits earned in non-degree status must be approved by both the student's major professor and the Director of Graduate Studies. Courses applied toward the degree must also fall within the specified time limit.

Transfer credits: At the doctoral level, courses are not officially transferred, although they may be used to meet degree requirements. Students with a master's or professional degree can use up to 24 credits from that degree to meet the PhD credit hour requirements. If a core coursework requirement has been met through coursework in another program, the student, in consultation with the committee, may petition the Director of Graduate Studies for a waiver of this requirement. Courses taken at universities outside of the UT system cannot be used to meet dissertation requirements or 600-level coursework requirements.

Degree Time Limit

Comprehensive examinations must be successfully completed within 3 years, and all requirements must be completed within 8 years from the time of a student's initial enrollment in the doctoral degree program.

Additional Requirements

UTCVM Research Day: Doctoral students are required to present at least two times in the annual UTCVM Research Day event. More details are listed on page 33 of this handbook.

Progress Report: Students who have been in the program for at least two semesters are required to complete a yearly progress report, which is completed each summer. More details are listed on page 33 of this handbook.

Responsible Conduct of Research Training: All students must complete an approved responsible conduct of research training program by the end of their 3rd semester. More details are listed on page __ if this handbook.

PhD Residence Requirement

Residence is defined as intensive study over **consecutive** semesters (summer included). Doctoral students may satisfy the residence requirement by enrolling in two consecutive semesters of at least 9 credit hours or three consecutive semesters of at least 6 credit hours.

Dissertation Continuous Registration

Students who have started taking dissertation credit hours in course 600 Doctoral Research and Dissertation must **continuously register** for course 600 for a minimum of 3 credit hours every semester. This includes summer semester and the semester in which the dissertation is approved and accepted by the Graduate School.

Students who have started taking course 600 and wish to do an internship/practicum relevant to their degree can petition to be exempted from the continuous enrollment requirement for up to three semesters or 12 months (maximum) by submitting a 600 Continuous Enrollment Exemption request form.

PhD Committee

During the **first year** of graduate study, the student works with the major professor to identify a PhD committee. The committee, subject to Graduate Council policies and individual program requirements, must approve all coursework applied toward the degree, certify the student's mastery of the major field and any cognate fields, assist the student in conducting research, and recommend the dissertation for approval and acceptance by the Graduate School. The student should meet with their committee at least twice a year. At the time of the first meeting, the student should declare a research emphasis area, with approval of the committee.

The committee must have at least four members. At least two members must be UT tenured or tenure-track faculty, at least one member must be from the College of Veterinary Medicine (this can include the major professor), and at least one member must be from outside of the student's department/interdisciplinary program (this external member can be from outside of UT). If the student is pursuing a minor, one member must have expertise in the minor discipline. Following best practices, faculty who have personal relationships that might affect committee functioning (e.g., spouses, family members) may not serve together on PhD committees.

To officially establish the committee, the student must submit the PhD Committee Form, **along with the CVs of any external members**, to the Graduate School for final approval by the Dean of the Graduate School. Any changes in committee membership must be submitted for approval using the Revise PhD Committee Form.

Admission to Candidacy

A student may apply for admission to candidacy for the doctoral degree after passing the **comprehensive examination** (details on pages ____) and maintaining at least a 3.00 GPA in all graduate coursework. The Admission to Candidacy Application must be submitted to and approved by the Graduate School at least one full semester prior to the date the degree is to be conferred. Once approved, any revisions needed to add or remove courses for candidacy must be done by submitting a Revised Admission to Candidacy-Doctoral Degree Form.

Comprehensive Examination

This examination should be taken when the student has completed, or nearly completed, all prescribed courses and should be completed before the end of the **third year** of the program (medical residents pursuing a PhD degree have until the end of their fourth year). Successful completion indicates that, in the judgment of the faculty, the doctoral student can think analytically and creatively, has a comprehensive knowledge of the field and the specialty, knows how to use academic resources, and is deemed capable of completing the dissertation. The comprehensive exam should be a learning experience in which specific skills are developed, including effective and comprehensive literature review, writing ability, experimental design for hypothesis-driven research, and oral presentation skills. **The comprehensive exam must be passed prior to admission to candidacy.** In case of failure, the candidate may not take the examination again until the following semester. The result of the second examination is final.

The exam will consist of two parts: 1) a written research proposal/grant application. 2) an oral exam that assesses the general knowledge of the student in the research emphasis area and serves as a defense of the written proposal.

Comprehensive Exam Timeline Overview

Student and major professor plan the semester in which the student should take their comprehensive exam	This should be done well in advance of completing their 3rd year. Students should schedule and set the date for their oral examination portion before starting the process below, to ensure committee availability and room scheduling.
Student submits proposal topic to major professor for approval	Well in advance of completing their 3rd year.
Student independently writes their full research proposal	Student is given 4 weeks to complete the research proposal after topic approval. Then submits the proposal to their committee.
Committee reviews written proposal ahead of oral examination	Committee should have 3 weeks between receiving the written proposal and the oral examination date to review the proposal.
Oral examination and results	Students receive comprehensive exam results immediately following oral examination.

Part 1 – Written Examination: Submission & Approval of Research Proposal Topic

The student will submit to their major professor a topic for a written grant proposal and a short statement defining the subject area (no more than 1 page in length). The student can get feedback from their committee regarding the topic, but their major professor gives the final approval. The proposal topic may be conceptually related to the student's intended doctoral research, but need not be identical in terms of experimental design. **Once approved, the student informs the committee of the topic and timeline.** The student will have **4 weeks** to submit the completed written proposal to the members of the committee.

The proposal must be written completely independently by the student. The major professor should guide the student on the overall project idea, but the 4-week preparation and writing process should be independent of the major professor. In preparation for the written exam, students will need mentoring and/or coursework on how to prepare a compelling grant. This assistance should be provided well in advance of the 4-week writing period.

Format and Submission of Written Research Proposal

The proposal should adhere to the following guidelines (similar to an NIH R21 or equivalent grant mechanism), including page restrictions. **Standard Project Timeline: 2 years**

Proposal Style & Page Limitations

File Type	Editable Microsoft Word document
Font Requirement	Arial, Helvetica, Palatino Linotype, or Georgia typeface; black font color; at least 11-pt font; single spaced
Margins	At least 0.5" on all sides
Paper Size	8.5" x 11"
Page Limits	
Project Narrative	4 lines (1 short paragraph)
Project Summary - Abstract	30 lines
Specific Aims – Hypothesis	1 page
Research Strategy	6 pages
Bibliography	Unlimited
Biographical Sketch	2 pages

Face page: Proposal title, investigator, committee members' names, & project start and end dates.

Project Narrative: Describe the relevance of this research to public health or applied field. Use plain language that can be understood by a general, lay audience.

Project Summary/Abstract: Meant to serve as a succinct and accurate description of the proposed work when separated from the application. This section should be informative to other persons working in the same or related fields and understandable to a scientifically or technically literate reader.

Specific Aims: Briefly state the objectives of the research. List the specific goals and any hypotheses to be tested, and summarize expected outcomes and impact of the results.

Research Strategy: Include significance, innovation, and approach sections.

- **Significance:** Importance of the problem or critical barrier to progress in the field that the proposed project addresses. How the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields. How concepts, method, technologies, treatments, services, or preventive interventions that drive this field will be changed if the proposed aims are achieved.

- **Innovation:** How the application challenges and seeks to shift current research or clinical practice paradigms. Describe any novel theoretical concepts, approaches, or methodologies; instrumentation or interventions to be developed or used; and any advantage over existing methodologies, instrumentation, or interventions. Explain any refinements, improvements, or new applications of these approaches.

- **Approach:** Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims. Include how the data will be collected, analyzed, and interpreted. Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims. If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high-risk aspects of the proposed work. Point out any procedures, situations, or materials that may be hazardous to personnel and precautions to be exercised. If there are multiple specific aims, you may address significance, innovation, and approach for each specific aim individually or for all specific aims collectively.

Bibliography: List references cited in the text using a single, scientific journal format. Where appropriate, each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication.

Biographical Sketch: Student's biographical sketch should be in the NIH format found here, or an equivalent grant format. Do not include an eRA Commons user name. Following the educational block, complete only sections A and B, as described hereafter.

A. Personal Statement. Briefly describe why you are well-suited for your role in the project. The relevant factors may include aspects of your training; your previous experimental work on this specific topic or related topics; your technical expertise; your collaborators or scientific environment; and your past performance in this or related fields.

B. Positions and Honors. List in chronological order previous positions, concluding with your present position. List any honors.

Project Budget: No written budget is expected. In lieu of a written NIH/NSF format modular/R&R budget, the student should be prepared to discuss, during the oral exam (Part 2), the budget needed to carry out the proposed project. The budget and study time frame should stay within the constraints (2 years; $275,000 direct cost).

Assessment of Written Proposal

Each member of the committee will evaluate the proposal. The major professor should ensure that a copy of the written proposal is filed in the CEM Program Office.

Part 2 – Oral Examination

No more than 3 weeks after submitting the written research proposal, the student should sit for the oral examination with all of the committee members. The student's oral exam will be closed-door with the student's committee members. The Director of Graduate Studies can also be invited to attend. The oral examination should be **scheduled** as early in the process as possible, preferably before the topic is chosen. The CEM program office is available to assist the student in securing an exam room once the committee and student have agreed upon a date and time for the exam.

Students should prepare a summary of their grant proposal and give a brief 10-20-minute presentation. The oral exam is intended to establish the student's ability to orally present and defend a research proposal as well as to survey the student's general breadth of knowledge in the primary study area. Therefore, students should expect questions that probe their scientific knowledge as it relates to the subject matter of the research proposal. Although students are not expected to prepare a written, formal budget, the student should be prepared to discuss, during the oral exam, the budget needed to carry out the proposed project.

Assessment of Oral Examination

The committee will convene immediately after the oral examination to determine if the student has successfully passed the oral exam. The student will pass the examination provided it has been established that:

- A consensus exists among the examining committee members in favor of passing with at least a 2/3 majority on the committee (including the vote of the Director of Graduate Studies, if they choose to vote).
- An appropriate number of questions dealing with the declared research emphasis area were administered.
- The examination was fair and rigorous.

If the committee decides against a grade of pass for the oral exam, a time for re-examination – not before the following semester and including a revision of the written proposal – should be scheduled before the end of the current semester.

The major professor is to send a short summary of the oral exam with a record of its outcome to the Director of Graduate Studies no later than 2 weeks after the examination is completed.

Dissertation

The dissertation represents the culmination of an original research project completed by the student. The organization, method of presentation, and subject matter of the dissertation are important in conveying to others the results of such research. The dissertation must be prepared according to the guidelines provided on the Theses and Dissertations webpage, including the requirement to use university-approved plagiarism detection software prior to the defense.

Upon successful defense of the dissertation, the final electronic copy must be submitted to TRACE (Tennessee Research and Creative Exchange) and must be accompanied by a Thesis/Dissertation Approval Form signed by all members of the doctoral committee. The approval sheet certifies to the Graduate School that the committee members have examined the final copy and found that its form and content demonstrate scholarly excellence. An Initial Embargo Request is required if a student would like to request an embargo on their work. The Survey of Earned Doctorates certificate of completion is also submitted at this time.

Final Examination (Defense of Dissertation)

A doctoral candidate must pass an oral defense of the dissertation. The examination is announced publicly and is open to all faculty members. The defense of the dissertation will be administered by ALL members of the PhD committee after completion of the dissertation and all course requirements. The examination must be passed by a simple majority. The dissertation, in the form approved by the major professor, must be distributed to the committee at least two weeks before the examination.

The student should start working with the CEM office to schedule their defense date early in the semester in which they plan to graduate. After a defense date and time are confirmed and scheduled by the CEM office, the student must submit a Schedule of Dissertation/Capstone Defense Form to the UT Graduate School. The student is responsible for complying with the graduation deadlines provided by the Graduate School Graduation Deadlines page.

Upon successful defense of the thesis, the final electronic copy must be submitted to TRACE (Tennessee Research and Creative Exchange) and must be accompanied by a Thesis/Dissertation Approval Form signed by all members of the committee. The approval form certifies to the Graduate School that the committee members have examined the final copy and found that its form and content demonstrate scholarly excellence. An Initial Embargo Request is required if a student would like to request an embargo on their work for 1, 3, or 5 years.

Following the oral defense, the Report of Final Examination must be submitted to the Graduate School by the deadline date for that semester. Requests for second attempts must be sent to the Director of Graduate Studies for approval/disapproval. In case of failure, the student may not apply for re-examination until the following semester. The result of the second examination is final. Information on the appeals process is located in the Grievances and Appeals section of this handbook.

The final examination should also fulfill the following CEM guidelines:

- A seminar will be scheduled and presented by the student. The seminar will be announced through the CEM program office and be open to all interested persons at UT. Seminar announcements should identify this as a dissertation defense.
- This is an official university academic activity; pets (with the exception of service animals) and young children are not permitted to attend.
- Students should not bring refreshments to the defense.
- At the end of the presentation, questions will be open to the audience and be appropriate to that presentation.
- An oral defense of the dissertation, by the student, will be conducted by the PhD committee immediately following the seminar.
- The Director of Graduate Studies is also invited to attend the oral defense.

Program Deadlines for Completion of PhD Degree

	Year 1			Year 2			Year 3			Year 4		
Semester	1	2	3	4	5	6	7	8	9	10	11	12
Entry into program	X											
PhD committee approved			X									
Responsible Conduct of Research training			X									
Take comprehensive examination									X			
Submit admission to candidacy form											X	
Dissertation credit hours							X	X	X	X	X	X
Final exam/dissertation defense												X

* Yearly Progress Report due each summer and 2 UTCVM Research Day presentations before graduation.

** X indicates the deadline, but these tasks should be completed prior to the deadline.

PhD with Concurrent MS Degree

The CEM program offers a concurrent master's degree option for doctoral students who plan to complete the master's degree while maintaining enrollment in the doctoral program. **The concurrent master's degree is designed primarily for the benefit of those entering the PhD program with a baccalaureate degree only.** Students will gain experience working with a committee, performing research, and writing that will help prepare them for their PhD work. The degree requirements for the concurrent MS/PhD are integrated within the degree requirements for the PhD, with a common committee (except in special circumstances; i.e., when the research emphasis area for the MS is different from that for the PhD). To apply for a concurrent MS degree, students must submit a Request for Concurrent Master's Degree in accordance with the instructions on the form.

To earn the concurrent master's degree, **all requirements must be met at the University of Tennessee.** The student will decide the **path to degree** as outlined below. Concurrent master's students will be expected to follow all of the requirements for a CEM master's degree. This includes forming a master's committee and submitting a Masters Committee Appointment Form to the Director of Graduate Studies for approval.

Path 1: MS with thesis; PhD with dissertation
Students will progress through the MS program requirements and complete a thesis and oral defense before attempting the PhD comprehensive examination and completing the dissertation and dissertation oral defense. Six credit hours of 500 Thesis and 24 credit hours of 600 Dissertation are required. Students who have already started taking dissertation credit hours will need to register for both 500 Thesis and 600 Dissertation. **Note: Credit hours earned in 500 Thesis may not be counted toward PhD candidacy.**

Path 2: MS with project in lieu of thesis option; PhD with dissertation
Students will progress through the MS program requirements with 6 credit hours in CEM 501/510/515 completed under the supervision of the student's major professor and committee. The individual project will involve a literature survey, development of a pre-doctoral fellowship grant targeted toward a specific funding agency, or other comparable project deemed acceptable by the student's committee. The student will undergo an oral defense of the project before attempting the PhD comprehensive examination and completing the dissertation and dissertation oral defense.

DUAL DVM-PHD

The College of Veterinary Medicine and the CEM program offer a coordinated accelerated dual program leading to the conferral of both the Doctor of Veterinary Medicine and the Doctor of Philosophy degrees in less time than would be required to earn both degrees independently. This accelerated program is designed to prepare highly motivated students for a career in veterinary research.

16 credit hours in **Core Coursework***

- *CEM 504 Descriptive and Applied Epidemiology **(3 credit hours)**
- *CEM 541 Cellular and Molecular Basis of Disease **(3 credit hours)**
- *CEM 616 Comparative & Experimental Medicine Seminar **(1 credit hour)**
- *Journal Clubs 500- or 600-level **(6 credit hours)**
- *Statistics 500- or 600-level **(3 credit hours)**

32 credit hours in graduate coursework.

- The CEM program will award up to 32 credit hours of DVM coursework toward the PhD in approved **preclinical** courses offered by the College of Veterinary Medicine. These courses must be graded A-F, with an earned grade of at least a B. Courses eligible for dual credit will be at the recommendation of the student's CEM major professor in consultation with the student's PhD committee.

24 credit hours of course CEM 600 Doctoral Research and Dissertation.
72 credit hours total

The doctoral comprehensive examination must be successfully completed within **2 years** of completing all DVM coursework.

Students entering the dual degree program must meet the minimum admission requirements for both the DVM and PhD programs. Applicants for the dual program must make separate application to, and be competitively and independently accepted by, the College of Veterinary Medicine for the DVM and the CEM program for the PhD. Students who have been **admitted** to the College of Veterinary Medicine may apply for approval to pursue the dual program at any time prior to or after matriculation. Such approval will be granted, provided that dual program studies are started prior to entry into the fourth semester of DVM coursework.

Students enrolled in the dual program will be officially classified as primarily veterinary students until the DVM coursework is completed, with the following exception: dual program students will typically enroll as primarily PhD students during the summer semesters following completion of their first and second years in the veterinary curriculum. After the DVM is conferred, the student's primary major will be CEM.

Degrees do not need to be awarded simultaneously. If a dual student has not completed the requirements for the PhD, the student may still be awarded the DVM. If the student completes the PhD requirements, but does not complete the DVM, the student may still be awarded the PhD. Students must satisfy the graduation requirements of each program.

One Health Minor

CEM offers a graduate minor in One Health. Emerging infectious diseases, controlling zoonoses, antibiotic resistance, and food safety threaten economic stability, human life, and biodiversity. Global One Health initiatives have been developed to protect global health security by creating transdisciplinary collaborations among human, animal, and environmental sectors.

The One Health minor is for undergraduate and graduate students wishing to develop skills to prepare themselves for careers in agricultural, environmental, and human sciences in addition to scientific policy and communication. The required courses are interdisciplinary and will provide training in communication and leadership, translation of evidence to policy, and One Health that is relevant for all majors.

For advising needs, students should contact the One Health Scholar within their college. For more information on the One Health minor, contact us at onehealth@utk.edu or visit us at: https://onehealth.tennessee.edu/

The minor consists of **10 credit hours** (four courses) in three areas of focus, as detailed below:

Category 1: Communication and Leadership (3 credit hours)

This category introduces students to the importance of communicating scientific information by gaining skills in oral communication and leadership.

Select one course:

- ALEC 520 - Leadership Development in Organizations and Community Nonprofit
- ALEC 522 - Supervisory Leadership
- ALEC 535 - Communicating in Agriculture and Natural Resources
- ALEC 551 - Servant Leadership in Agriculture and Natural Resources
- CMST 554 - Organizational Communication, Strategic Leadership, and Culture

Category 2: Translation of Evidence to Policy (3 credit hours)

This category allows students to gain knowledge in analyzing and understanding public policy and its impact on One Health at the national and global levels.

Select one course:

- NURS 612 - Health and Health Care Policy
- POLS 514 - Research Design and Methodology in Public Administration
- POLS 549 - Environmental Policy
- POLS 551 - Energy Policy
- POLS 556 - Policy Analysis

Category 3: One Health (4 credit hours total)

This category prepares students to explore and respond to One Health issues at both a local and global level.

Select both courses:

- CEM 506 - One Health (3 credit hours)
- Journal Club that addresses One Health issues, as approved by the CEM Director of Graduate Studies (1 credit hour)

Additional Requirements

Graduate Committee

The student's graduate committee must include at least one member who is affiliated with One Health (teaches one of the courses in the minor or is active in One Health initiatives), as approved by the student's major professor and the CEM Director of Graduate Studies.

Admission to Candidacy

When application is made for admission to candidacy, the minor and the courses required for the minor must be indicated.

Students who do not complete the requirements of the minor will still receive academic credit for the courses they have successfully completed.

Legal Requirements for Research

Institutions of higher education have maintained a centuries-old tradition of integrity and objectivity. UT is pleased with the overall support given by its faculty, staff, volunteers, and students in upholding this tradition and wants to ensure that the highest level of integrity in all academic activities is continued. Therefore, any individual who has reason to believe that they have knowledge of an act of research misconduct, including fabrication of results, plagiarism, and/or misrepresentation of findings, should communicate this information to a supervisor or appropriate administrator. If an allegation of misconduct is substantiated, the chief administrative officer of the campus will initiate the applicable disciplinary procedures, and sanctions, if appropriate, will be imposed under those procedures.

Responsible Conduct of Research and Compliance Training

All researchers at UT are expected to comply with the university's research policies, regulations, and guidelines. Information and required forms are available at UT's Division of Research Integrity & Assurance. Regulations must be followed for all research, especially that involving animal care, biosafety, human subjects, and radiation.

It is required that all students in the CEM program complete training in the responsible conduct of research during their first year of study.

Training may be acquired by completing one of the following options:

1. Satisfactory completion of approved online training modules: CITI - Collaborative Institutional Training Initiative
2. Graduate course: **CEM 525 Research Ethics for the Life Sciences**

Additional opportunities for responsible conduct of research training may be available through the UTIA and UT Knoxville research offices, as well as through periodic training sessions from other campus groups.

Upon satisfactory completion of responsible conduct of research training, students should record the training as part of their yearly progress report.

Yearly Progress Report

Each summer semester, students who have been in the CEM graduate program for at least two semesters must meet with their major professor to discuss their progress and performance. The major professor is responsible for providing a written evaluation describing the student's accomplishments, strengths, and deficiencies and, if necessary, suggested corrective actions. In the event of an anticipated unsatisfactory evaluation, the major professor consults with the student's advising committee before preparing the evaluation.

Following the major professor's evaluation and prior to the start of fall semester, the student must submit a report packet to the CEM program office. The packet includes a detailed reporting form, a current curriculum vitae (CV), and a copy of the major professor's evaluation. The reporting form includes explanations and corrective actions to be taken in response to deficiencies or unsatisfactory progress reported in the major professor's evaluation. The packet will be available to the major professor and to members of the student's advising committee.

If warranted, the Director of Graduate Studies will notify the student, the major professor, and the student's advising committee that a report of unsatisfactory performance is being made to the AAPC. The AAPC will review the report and any additional materials provided by student's committee members and decide if there are grounds for probation or dismissal from the program. Should a progress report not be filed by the specified deadline, access to financial support may be jeopardized, and students may be restricted from registering for courses.

Guidelines for Students

Commitment to the Program

Students are expected to fully participate in professional activities related to the CEM program.

Adequate Preparation

With regard to learning in their respective courses, students have the responsibility to seek the information necessary to participate in classroom activity. Students should accept responsibility for adequate preparation for each class meeting, arriving for all classes able and willing to interact through classroom participation, testing, writing, in-class exercises, and other methods provided by the instructor. Basic to these activities is the need for students to employ appropriate resources, as assigned by the instructor, such as textbooks, other supplies, and outside reading materials.

Satisfying University Requirements

It is the student's responsibility to be aware of and follow guidelines, schedules, and deadlines provided by the CEM program, the Graduate School, the university, and instructors. All regulations must be satisfied in a timely fashion.

Guidelines for Faculty

Atmosphere for Teaching and Learning

It is important that the faculty member create from the beginning, and preserve, an atmosphere conducive to learning. Both teacher and student should feel that they have come together in the common cause of the pursuit of learning. Faculty members should ensure that their students are progressing through their course of study in a timely fashion.

Conducting a Course

It is the instructor's responsibility to organize class material as efficiently and effectively as possible at the beginning of each term of instruction. At the beginning of the semester, faculty members will distribute to students a syllabus that makes clear the basis of the final grade with regard to the value placed on each component of the course. The faculty member should set an example for students in being faithful in attendance and punctual in starting and ending classes. Students should be informed of all planned instructor absences as early as possible.

In presenting course content, the faculty member should endeavor at all times to adhere to the subject; the classroom should not be used as a theater for expression of personal views that are not germane to the course.

Guidelines for Major Professor (Primary Advisor/Mentor)

The major professor, in conjunction with the graduate committee, is primarily responsible for supervising and guiding the student's graduate program. This includes ensuring adequate funding for the student's research, stipend, and/or tuition; compliance with Graduate School and CEM program requirements and deadlines; timely progress through the student's program of study; and successful completion of the student's thesis/dissertation, with publication of the student's work as the first author in peer-reviewed scientific journals before or shortly after graduation. The major professor will act to best serve the research, education, and career development of the student.

Academic Standing

Expectations for Good Standing

Students in the CEM program are expected to maintain a 3.00 cumulative grade-point average (GPA) on all graduate courses graded A–F. For all other courses, a grade of either P or S must be received. In addition, students are expected to make reasonable progress in their thesis/dissertation research projects. The CEM program has a formal process for annual evaluation of student progress in the form of a yearly progress report. The process is designed to optimize the value of individual student programs and to ensure timely progression through degree requirements.

Grade of Incomplete

Under extraordinary circumstances the grade of I (Incomplete) may be awarded to students who have satisfactorily completed a substantial portion of the course requirements but cannot complete the course for reasons beyond their control. **It is the responsibility of the student** receiving an I grade to arrange with the course instructor whatever action is needed to remove the I grade at the earliest possible date. If the I grade is not removed within one calendar year or upon graduation, it will be changed to an F and count as a failure in the computation of the GPA. **No student may graduate with an "I" grade on record** (see Graduate Catalog for additional information).

Repeating Courses

Graduate students may repeat up to two courses in which they earned a grade of D or F. The decision to repeat a course is made between the student and the major professor. Each course may be repeated only once. Both the original and repeat grades will be included in the calculation of the cumulative GPA. Credit hours will only be counted once toward meeting degree/program requirements.

To re-enroll in a class in order to improve an earned grade, the student must complete a Permission to Repeat a Graduate Course Form and submit it to the Director of Graduate Studies to co-sign. Final approval rests with the Dean of the Graduate School.

Academic Probation

Upon completion of 3 or more credit hours of graduate coursework, if a student's cumulative GPA falls below 3.00, the student will be placed on academic probation. The student will be allowed to continue graduate study in subsequent semesters if each semester's grade point average is 3.00 or greater. Upon achieving a cumulative GPA of 3.00, the student will be removed from probationary status.

Dismissal

If a student is placed on academic probation, the degree status will be terminated by the Dean of the Graduate School if the student's semester GPA falls below 3.00 at the end of the next semester. When the particular circumstances are deemed to justify continuation, and upon recommendation by the Director of Graduate Studies and approval of the Dean of the Graduate School, a student on probation whose semester GPA is below 3.00 may be allowed to continue on a semester-by-semester basis. Other terms of dismissal are failure to pass the comprehensive or final examination (requests for second attempts must be sent to the Director of Graduate Studies and reviewed by the AAPC for approval/disapproval), failure to meet CEM program time limit requirements, violations of academic honesty, research misconduct, or unsatisfactory progress. Unsatisfactory progress includes two consecutive grade reports of "No Progress" (NP) in 500 Thesis or 600 Dissertation. Dismissal of a graduate student from the CEM program is accomplished by written notice to the student, with a copy to the Graduate School. In those cases where the department's requirements for continuation are more stringent than university requirements for graduate programs, the Dean of the Graduate School will evaluate the student's record to determine whether the student is eligible to apply for a change of status and register in another area of study. Registration for courses in the CEM program by students dismissed from the program will not be permitted, except by written authorization from the Director of Graduate Studies.

Academic Honesty

Expectations

Plagiarism or academic cheating of any description (during closed-book examinations, thesis/dissertation preparation, manuscript preparation, and research) is considered a serious breach in academic honesty, as is falsification of data.

Violations

Violations of academic honesty by a student should be reported in writing to the Director of Graduate Studies. The student will be notified, in writing, of the charge(s) by the committee within 7 days of the latter receiving the charge. The Director of Graduate Studies will investigate the circumstances of the alleged offense by meeting with both the accuser and the accused and either impose a penalty or dismiss the charges within 30 working days of student notification of the charge (unless an extension requested by the student is approved).

Penalties

Appropriate penalties for violation of academic honesty are probation, suspension, or dismissal. The exact penalty will depend on the circumstances under which the violation was committed.

Appeals

After a hearing by a CEM appeals panel, a student dissatisfied with the decision rendered may appeal the decision to the Appeals Committee of the Graduate Council in the manner detailed in *Hilltopics* under Student Code of Conduct

Conflicts of Interest

- Students are discouraged from providing food and refreshments for participating faculty during comprehensive examinations and thesis/dissertation defenses. The student being examined is not expected or required to dothis, and the action may place examining faculty in an uncomfortable situation. Following a successful examination or thesis/dissertation defense, it is then acceptable for participating faculty to be invited to a celebration.

- Students are not required to provide food and refreshments at regular committee meetings, and providing anything beyond inexpensive snacks and coffee or soft drinks is strongly discouraged.

- Students should not give gifts to faculty in the CEM program, including their own major professor, before theyhave completed all requirements for their degree. Although gift giving is common in other cultures, this practice can be misinterpreted as creating or contributing to a conflict of interest, and is therefore strongly discouraged.

Conflict Resolution

If a conflict develops between a student and the student's major professor, both parties should work to correct the interfering issues. Conflicts may include issues of disruptive conduct and insubordination. If the conflict cannot be resolved, the professor or student should request mediation through the Director of Graduate Studies.

If all efforts fail and the professor decides to stop serving as the student's major professor, that professor documents in writing all the problems and the attempts to make corrections and provides a copy to the student, the student's committee members, and the Director of Graduate Studies. Conversely, students may similarly request changes.

Under either scenario, to remain in the program, the student must provide to the Director of Graduate Studies a written explanation and request to formally visit with other program faculty (as in laboratory rotations) or to associate formally with another faculty member (who must provide written agreement). The Director of Graduate Studies will notify the student, the major professor, and the student's advising committee of their decision. The CEM program is not responsible for replacing any stipend and tuition support provided by the first faculty mentor, and it is possible that stipend and tuition support for the student may be lost.

GRIEVANCES AND APPEALS PROCEDURES

Graduate students and faculty should first try to resolve any grievances through informal discussions. If a satisfactory resolution is not met, the student should file a grievance in writing to the Director of Graduate Studies. If applicable, any person accused in the grievance must be notified, in writing, by the Director of Graduate Studies within 7 days of receiving the written allegation. The student must present details of the grievance in person and provide documentation of the issue. The Director of Graduate Studies will work with the student to appoint a three-member panel composed of faculty who are not involved in the dispute. The panel will render a decision within 30 working days of receiving the grievance, unless an extension requested by any of the parties involved is approved.

If the student is not satisfied with the decision of the panel, further appeals may be made to the Graduate Council Appeals Committee by contacting the Office of the Assistant Dean of the Graduate School at gradschool@utk.edu. The Assistant Dean will work with the student and the Chair of the Appeals Committee to process the appeal as outlined in the Graduate Council Appeal Procedure.

There are three types of appeals that may come before the Graduate Council Appeals Committee: 1) students with grievances concerning the interpretation of and adherence to university, college, and department policies and procedures as they apply to graduate education; 2) students with grievances concerning grades; and 3) students with grievances concerning academic penalties imposed for academic and/or research misconduct.

Academic misconduct is a violation of the UT Student Code of Conduct. Allegations of academic misconduct are handled as described in the *Hilltopics* student handbook under Student Code of Conduct.

Allegations of research misconduct are managed through UT's Division of Research Integrity & Assurance.

Students with grievances related to race, sex, color, religion, national origin, age, disability or veteran status should file a formal complaint with the Office of Equity and Diversity, 1840 Melrose Avenue.

For all other problems students may encounter related to their graduate studies that they feel cannot be addressed by or to their major professor and committee, students are strongly encouraged to seek guidance from the Director of Graduate Studies.

Undergraduate students who wish to appeal a grade in a graduate course should follow the procedures outlined in the Undergraduate Catalog. No appeal may be filed later than 90 days after the final grade has been issued

Student Resources

CEM Website

Applications and Admissions

- Graduate School Admissions
- SLATE Application Steps

Funding

- Costs and Funding Opportunities
- Financial Aid and Scholarships
- GSS Student Travel and Support Awards

Graduate School

- Graduate School Main Website
  - Graduate School Graduation Deadlines
  - Graduate School Forms
- Graduate Student Senate
  - GSS Student Travel and Support Awards

Theses/Dissertation

Theses and Dissertation Help Current Coordinator of Student Services at the Graduate School is Abby Sherman thesis@utk.edu	The Coordinator of Student Services is available to assist in many areas: • to show students resources for research approval and understanding of copyright • to demonstrate how to use iThenticate to validate the work • to outline the approval process • to ensure that theses and dissertations conform to the formatting requirements of the University of Tennessee • to provide guidance in submitting the work to TRACE • to explain the policies around the public availability of theses and dissertations
Research Support and Resources	Resources for your research.
Graduate Student Writing Help	Help graduate students with coursework-related writing, theses and dissertations, and application materials.
Library Services and Resources	All about library services and resources to support your research & teaching needs.
Pendergrass AgVet Library Main Page	Main page for the Pendergrass AgVet Library, located on the 1st floor by the Pod
Pendergrass AgVet Library Study Room Reservations	To reserve a study room in the Pendergrass AgVet Library

Additional Student Resources

- Academic Appeals
- Center for Global Engagement
- Counseling Center
- Office of Equity and Diversity
- Housing
- International House
- Multicultural Student Life
- OIT- Office of Information Technology
- Office of Ombuds Services
- Division of Research Integrity & Assurance
- Safety – LiveSafe Campus Safety App
- Student Conduct and Community Standards
- Student Health Center
- Title IX, Office of (sexual assault, relationship violence & stalking)