

# GRADUATE STUDENT HANDBOOK

## COMPARATIVE AND EXPERIMENTAL MEDICINE

an intercollegiate graduate program at the University of Tennessee

2016–2017 ACADEMIC YEAR

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# TERMS AND ABBREVIATIONS

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**CEM:** Comparative and Experimental Medicine

**UT:** University of Tennessee

**UTHSCK:** University of Tennessee Health Science Center Knoxville

**UTIA:** University of Tennessee Institute of Agriculture

**AAPC:** Admissions and Academic Progress Committee

**CC:** Curriculum Committee

**CEM program:** Comparative and Experimental Medicine graduate program

**CEM program director:** Dr. Stephen A. Kania, Professor

**CEM program office:** Administers the CEM program. Located in A102 Veterinary Medicine Building

**Credit hours:** The number of contact hours per week in a given course in a given semester

**Major professor:** The main advising professor/mentor on the student's faculty committee

**Semester:** The UT-established period for the duration of a course (normally fall, spring, and summer)

**UT Graduate School:** The University of Tennessee Graduate School. The CEM program operates under the umbrella of the UT Graduate School, whose main office is located at 111 Student Services Building, Knoxville, TN 37996-0211, USA.

**UT Office of Graduate Admissions:** The admissions department of the UT Graduate School. Located at 201 Student Services Building, Knoxville, TN 37996-0230, USA.

**UT Registrar's Office:** Oversees enrollment services, grades, graduation, transcripts, and student records. Located in 209 Student Services Building, Knoxville, TN 37996-0200, USA.

# WELCOME

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Welcome to the Comparative and Experimental Medicine (CEM) graduate program. We are pleased that you are interested in this exciting and unique multi-disciplinary graduate program at the University of Tennessee, Knoxville. The CEM program offers MS and PhD degrees in preparation for careers in the health sciences. It actively promotes the concept of "One Health/One Medicine" by emphasizing the comparative approach to the study of biomedical science.

The program is open to approved graduate students seeking biomedical training and is especially useful for individuals with, or working toward, professional degrees in the health sciences. The CEM program provides an opportunity to study disease processes common in animals and humans from a multi-disciplinary perspective. The scope of this intercollegiate program, which pools faculty resources from both veterinary and human medicine, is broadened by faculty members representing wide-ranging interests in biomedical disciplines and areas of the life sciences and forensic science. The interdisciplinary training environment includes such diverse support as facilities and personnel at the College of Veterinary Medicine, UT Medical Center at Knoxville, life sciences departments, College of Agricultural Sciences and Natural Resources, College of Engineering, the Department of Nutrition, and the Department of Public Health.

I hope 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. Additionally, faculty members within the program are listed with Web pages that contain phone numbers and E-mail addresses. We update this document periodically in light of changes instituted by the program or other administrative units.

We invite inquiries from individuals interested in being involved with the program as students, collaborators, faculty, or sponsors.



Stephen A. Kania, MS, PhD  
Professor and Director, Comparative and Experimental Medicine

# INTRODUCTION

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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 CEM program 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

Graduate students are expected to be aware of and satisfy all regulations governing their work and study at the university. However, since not all aspects of graduate study can be included here, students are urged to consult the following:

[Graduate Catalog](#) • [Hilltopics](#)

**Note:** All links in the handbook are underlined in blue font. Although the Web addresses may not be visible when the handbook is read in print, the Web version of this handbook contains clickable links: <https://vetmed.tennessee.edu/research/Documents/Handbook.pdf>.

## Administration of the Program

Dr. James P. Thompson, Dean of the College of Veterinary Medicine has executive administrative responsibility for the CEM. Dr. Michael McEntee, Associate Dean for Research and Graduate Studies, provides oversight of the program. Each academic department or program at the University of Tennessee has designated a tenured or tenure-track faculty member who is their director of graduate studies. This individual, with the assistance of the other graduate faculty in the program, is responsible for the administration of the graduate program and also serves as the contact person with the Graduate School.

Within the CEM program, Dr. Stephen Kania holds these responsibilities:

- Administering the CEM graduate program
- Serving as the contact person with the Graduate School
- Monitoring program admission and policies
- Working with program faculty on recruitment efforts
- Creating and updating department Graduate Handbook yearly
- Tracking assistantships (types, amounts, and responsibilities for each position)
- Following up on CEM program/Graduate School/university awards and fellowships

## Contact Information

**CEM Program Office:** A102 Veterinary Teaching Hospital

**Contact:** Kim Rutherford

**Address:** 2407 River Drive  
Knoxville, TN 37996-4550

**Phone:** (865) 974-0227

**Fax:** (865) 974-4773

**E-Mail:** [kimruth1@utk.edu](mailto:kimruth1@utk.edu)

**Director of Graduate Studies:** Dr. Stephen Kania, Professor

**Phone:** (865) 974-5576

**E-mail:** [skania@utk.edu](mailto:skania@utk.edu)

## Standing Committees

The Admissions and Academic Progress Committee (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 who will likely make important contributions to biomedical science. The specific responsibilities of the AAPC include:

- Annually review program-specific admissions requirements.
- Review applications and make applicant admission recommendations to the 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.

The Curriculum Committee (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 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.

## Guidelines for Students

### Commitment to Program

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

### Adequate Preparation

With regard to learning in his or her respective courses, the student has the responsibility to seek the information necessary to participate in classroom activity. The student 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 the student 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 very 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 his or her 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 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 graduate 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 advisor will act to best serve the research, education, and career development of the student.

# APPLICATION PROCEDURE

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Application materials must be submitted to the University of Tennessee Office of Graduate Admissions.

## Materials to Submit (<http://gradschool.utk.edu/admissions/>)

1. APPLICATION\*: Submit online to the UT Office of Graduate Admissions:  
<http://gradschool.utk.edu/admissions/applying-to-graduate-school/>
2. TRANSCRIPTS: One (1) set from ALL former schools
3. GRE SCORES: Submit if you do not have a professional degree from an accredited institution.
4. Three (3) letters of recommendation from referees. The referees should fill out the online recommendation form produced when that portion of your online application is completed.
5. International Students: Include your TOEFL or IELTS score.
6. APPLICATION FEE: \$60 non-refundable

\*Be sure to select Comparative and Experimental Medicine as your major in the "Major Info" section of the online application.

## International Students

- Review the application information for International Students:  
<http://gradschool.utk.edu/admissions/applying-to-graduate-school/admissions-for-international-students/>
- Pay particular attention to all deadlines; **there are no extensions:**
- **Official Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) results:** (TOEFL) Minimum 550 for the paper exam, 213 for the computer exam, or 80 for the Internet exam; (IELTS) Minimum 6.5

# ADMISSION REQUIREMENTS

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## General

Admission requirements of the UT [Graduate School](#) apply to prospective students of the CEM program. Applicants must furnish admission materials via the online application, as indicated on page 5.

## Requirements for Admission to the 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.

Applicants who do not have a professional degree from an accredited institution must have a combined score of at least 300 on the quantitative and verbal sections of the Graduate Record Examination (GRE).

## Requirements for Admission to the 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 and a GRE score of at least 300 on the quantitative and verbal sections.

An individual having 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 performance on the GRE.

## 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.

## Special Admissions Categories

### Non-degree

In special circumstances, non-degree status may be appropriate for applicants who, for example, need additional time to fulfill application requirements for a degree program or do not wish to pursue a degree program. Minimum requirements for the Graduate School must be met for admission to non-degree status, but application to the CEM program is not required at that time. A maximum of 15 graduate hours may be taken in non-degree status. If admitted into a degree program, no more than 15 graduate hours may be applied toward a graduate degree, if approved by the student's committee. International students on a student visa may not enroll in non-degree status.

## Seniors Eligible for Graduate Credit

Subject to approval by the Dean of the Graduate School, a senior at the University of Tennessee, Knoxville, who needs fewer than 30 semester hours to complete requirements for a bachelor's degree and has at least a B average (3.0) may enroll in graduate courses for graduate credit, provided the combined total of undergraduate and graduate coursework does not exceed 15 credit hours per semester. Only students working toward a first bachelor's degree are eligible. Students who have met all requirements for graduation are not eligible. A maximum of 9 hours of graduate credit at the 400- and 500-level can be obtained in this status. Courses taken for graduate credit may not be used for both the baccalaureate and a graduate degree program.

## Readmission

A student who has not registered for graduate courses (for this circumstance, 800-level veterinary courses are not considered graduate courses) for at least one semester (other than summer) must apply for readmission. A [readmission application](#) for domestic students must be submitted to the Office of Graduate Admissions at least two weeks prior to the first day of class of the desired semester of reentry. International students must follow published deadline dates for new international graduate applications when applying for readmission. A non-refundable readmission fee of \$30.00 must be submitted when applying for readmission. A student who has attended another institution since enrollment at UT must submit an official transcript showing all coursework and degrees obtained at the other institution.

## Change of Program

Applicable when:

- A currently enrolled graduate student at UT is seeking a change of graduate major, concentration, or degree objective.
- A currently enrolled graduate student at UT requests moving from non-degree to degree seeking (or vice-versa).
- A student requests admission to another graduate program immediately following the completion of his/her current graduate degree program at UT so that there will be no interruption of enrollment (summer excluded) between finishing one graduate program and entering another.
- A student who is currently enrolled in a doctoral program at UT Knoxville has decided to NOT complete the doctoral program but instead requests admission to a master's degree program within the same major and concentration if the following condition applies: The change of program is requested in such a way that there will be no interruption in enrollment (summer excluded) when moving from the doctoral program into the master's degree program.

Students who seek a change of program need to contact the CEM program office to ensure that they can be considered for admission. A non-refundable application fee in the amount of \$30 will be assessed upon each submission of the Change of Program Application.

A [Change of Program Application](#) must be submitted to the Office of Graduate Admissions at least two weeks prior to the first day of class of the desired term of entry. Stricter deadline dates may apply to international students, and international students therefore must consult with an international student advisor in the Center for International Education prior to submitting a change of program to discuss how the desired change of program would affect their immigration status.

## English Proficiency Conditional Admission

This type of admission facilitates admitting academically-qualified, degree-seeking international graduate students who have not satisfied the English proficiency requirement, yet are being considered for full admission. If conditionally admitted, applicants must fulfill the English proficiency requirement by entering the UT [English Language Institute's](#) intensive English language study program for no less than one semester but up to three consecutive semesters, including summer semester. The student may request a waiver from the Graduate School to attend a different U.S.-based and U.S.-accredited intensive English language program. Funding for enrollment in the English language program is the student's responsibility. The student may not enroll in any other UTK course while enrolled in the English Language Institute.

These students are guaranteed admission to CEM when the English proficiency condition and, if necessary, other conditions for admission have been completed. A student admitted conditionally under this policy will receive the appropriate documentation for entering the United States for English language study only. Upon completion of the course of study, the student must achieve a TOEFL score of at least 80 iBT (or 550 paper-based) or IELTS score of 6.5. If the student passes this language threshold, he/she will be expected to enroll as a degree-seeking student in CEM starting with the semester immediately following.

If a student is unable to fulfill the English proficiency condition within the required timeframe, admission to the graduate program will be revoked. In this case, the student has the following options:

- Submit a new graduate admission application and, if admitted conditionally, continue studying in the English language program.
- Leave the United States.
- Seek a transfer to another school in the United States.

### Admission for Faculty and Staff

If admitted to graduate study, members of the faculty or staff located in Knoxville may take courses as graduate students. Faculty members of the University of Tennessee, Knoxville, or the Institute of Agriculture at the rank of assistant professor or above and members of the administrative staff at the university and the Institute of Agriculture will not normally be admitted to a PhD degree program at UT Knoxville. Exceptions may be granted on an individual basis upon petition to the Dean of the Graduate School. Petitioners must present their request in writing, providing adequate assurance that the residence requirement will be met and that there will be no conflict of academic or administrative interest. Written endorsements must be provided by the respective deans and department heads of the units in which members are employed and in which the doctoral degrees are to be pursued.

## FINANCIAL SUPPORT

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### Assistantships and Fellowships

The College of Veterinary Medicine offers a limited number of ongoing graduate research assistantships in the CEM program. This and other methods of support may be arranged with individual investigators. Successful pairing with a mentor does not guarantee funding support. The following assistantships are awarded as funds become available:

#### Graduate Research Assistantships and Fellowships

Awarded as funds are available; applications reviewed several times per year. Persons with a professional degree in the health sciences (DVM, MD, DDS) 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 and/or tuition waiver.

#### Notification of Award:

Awardees are notified by a letter from the CEM program director.

#### How to Apply:

Requests must come through the major professor addressed to the CEM program director.

#### Requirements for Maintaining an Assistantship/Fellowship

- Students must be enrolled in at least 6 graduate credit hours per each fall and spring semester for a one-half time graduate assistantship, and at least 9 graduate hours for a one-fourth time assistantship. Enrollment must be at least 1 hour in summer; HOWEVER, to maintain student health insurance, 3 hours are required in summer.
- Students must make timely and satisfactory progress as described in the "Degree Requirements" and "Academic Status" sections of this handbook.

- Assistantships/fellowships are not automatically renewed. Students must submit a progress report each academic year to the CEM program director. Funding assistance is dependent on the availability of funds and satisfactory performance of the student's assigned duties.
- Instances in which a graduate assistant/fellow 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 his or her return. The leave of absence form must be filled out and submitted to the Graduate School for approval: <http://gradschool.utk.edu/forms-central/graduate-student-leave-of-absence/>.

## Workload for an Assistantship

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

The CEM program strongly discourages outside employment, as it will be very difficult to make adequate and timely progress toward a degree while holding several jobs.

## Graduate School Fellowships

The Graduate School administers the Hilton A. Smith Graduate Fellowships, the Herman E. Spivey Graduate Fellowships, and the University of Tennessee Graduate Student Fellowships. Other funding administered by the Graduate School includes J. Wallace and Katie Dean Graduate Fellowships, Yates Dissertation Fellowships, Black Graduate Fellowships, and Lori Mayer Re-Entry Women's Fellowships. [These awards](#) are for full-time study at UT Knoxville, and awardees are selected on the basis of high achievement, broad intellectual ability, and potential for significant career contributions. Requirements for maintaining these fellowships and information about workload may be found at the link in the previous sentence.

## Loans

The [UT One Stop Express Student Services](#) offers information on federal and private student loans.

## Employment

For graduate students with assistantships, employment at the university for more than 50% time (20 hours per week) requires special permission from the Graduate School. Other outside employment is strongly discouraged, as it will be very difficult for students to make adequate and timely progress toward a degree while holding several jobs.

## Health Insurance

All international students, as well as graduate assistants on at least a 25% appointment, enrolled in at least 3 credit hours per semester, are automatically enrolled in a health insurance program. Any student may opt out of the health insurance, but international students must provide proof of other coverage. To use the on-campus Student Health Center, students must pay the Health Fee each semester; for students enrolled in at least 9 hours in a semester, this fee is automatically applied as part of the Programs and Services Fee and cannot be reimbursed.

## Travel Support

The UT Graduate Student Senate administers travel support for professional activities. These awards are based on merit and help defray expenses for transportation, lodging, and registration fees. To request a travel award, students must submit an application to the Graduate Student Senate. Applications may be downloaded at <http://gss.utk.edu/travel-awards/>. Applications must be submitted to the Graduate Student Senate by the deadlines posted on their Web site.

## REGISTRATION AND ADVISING

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Registration is required of all graduate students when using university facilities and/or faculty time. The minimum number of credit hours for registration is one (1). Registration allows use of services such as library checkout, laboratories, and recreation facilities not open to the public.

Information concerning registration is available through Self-Service Banner via [MyUTK](#) each term. Registration is accomplished via Web, and *confirmation of attendance must be set in addition to registration*.

### Payment of Registration Fees

During priority registration, the VolXpress statements are delivered electronically. Students will receive an email at their University of Tennessee email address indicating their e-VolXpress statement is available for viewing. The e-mail will include the website address where the student may view the statement at [MyUTK](#). Payment is due by the deadline noted on the bill. A graduated late fee is assessed to any student who fails to register during priority registration. Additional information can be obtained from the One Stop Express Student Services Office, (865) 974-1111.

Failure to pay tuition and fees before the deadline, as noted each semester on the bill (VolXpress statement), will result in cancellation of the schedule. Retroactive registration is not allowed.

### Change in Registration

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 W" deadline.

Students who fail to attend the first class meeting without prior arrangement with the program may be dropped from the course to make space available to other students. Students have the responsibility to assure that they have been dropped. Otherwise, they may receive a grade of F in the course.

Type of Change for Full Term Classes Fall/Spring	Deadline (after class begins)
Add or drop a course without a W or change credit/grading	10 calendar days
Between 11 and 42 days with instructor's and advisor's signature	42 calendar days
Drop course with W	84 calendar days

The periods for add, drop, change of credit/grading for sessions within the full term, summer, and mini term are determined based on a percentage of the equivalent deadline within the full term. See the Office of the Registrar's Timetable/Financial Deadlines ([http://registrar.tennessee.edu/academic\\_calendar/index.shtml](http://registrar.tennessee.edu/academic_calendar/index.shtml)) each term for exact dates. Deadline dates will be moved to the next business day if the deadline falls on a holiday, weekend day, or fall/spring recess. Within the change of registration period, a student may change registration at MyUTK. If registering late, a student must complete a [Late Change of Registration Request](#). Total/complete drop of all classes past the "drop with a W" deadline is done by completing a [Withdrawal Form](#) through the Office of the University Registrar.

## 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 fundamental levels 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 500- and lower levels. Guidelines and requirements for 500- and 600-level CEM courses are provided. These guidelines and requirements are primarily for the multi-student courses offered in the program; however, aspects of the guides and requirements are also applicable to the variable credit, special, and advanced topics courses offered in the program.

### 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 least an assistant professor, 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 five 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. *The CEM program director must approve all special and advanced topics CEM course offerings, including credit hours.*

CEM 501 provides opportunities for specialized experiences in comparative and experimental medicine. This course should be used to meet the specialized needs of MS students and for projects appropriate for 500-level credit. Examples include research papers and analytical techniques and instrumentation involving established technologies. **Satisfactory/no credit grading.**

CEM 510 provides opportunities for students to learn advanced research techniques while conducting individual research projects under supervision of faculty. This course should be used to meet the specialized needs of MS students and for projects appropriate for 500-level credit. **Satisfactory/no credit grading.**

CEM 610 and 618 are advanced or special topics in comparative and experimental medicine, and medical science, respectively. These courses are intended primarily as specialized experiences for doctoral students in the CEM program and address new and developing topics in research and technology that may be applicable to doctoral-level research and/or clinical medicine. **Satisfactory/no credit and A–F grading, respectively.**

CEM 620 can be a 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. This course is intended primarily as a specialized experience for doctoral students in the CEM program and addresses topics that may be applicable to doctoral-level research and/or clinical medicine. **A–F grading.**

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 CEM program director using the [Course Request Form](#).

CEM 602 is a variable credit, surgery pathology course intended primarily for pathology residents pursuing graduate degrees. The CEM program director must grant approval to offer these courses for greater than 2 credit hours. The written request should be submitted to the CEM program office prior to the semester the course is to be offered and must justify the proposed credit hours.

## Enrollment Hours

### Minimum Enrollment

Students with a 50% (1/2 time) assistantship must enroll in at least 6 hours of coursework during the fall and spring semesters to be considered full time. Students with a 25% (1/4 time) assistantship or no assistantship must enroll in at least 9 hours of coursework during the fall and spring semesters to be considered full time. To retain student health insurance, students with an assistantship should enroll in at least 3 hours of coursework during the summer semester.

### Maximum Enrollment

The maximum number of course hours for which students may register during spring and fall semesters is 15. During summer, the maximum number of course hours is 12.

### 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 University Libraries or use of computer labs, other labs, and/or other university resources.

Course 500: Thesis is for the master's-level student working on a thesis. Six hours of course 500 must be taken for the degree, and students must register for course 500 each semester during work on the thesis. At least 3 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 hours of course 600 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 hours (including summer semester) in course 600 is required thereafter.

## Selection of an Advising Committee

Students who are notified of having met the minimum requirements for admission to the CEM program should determine a major professor assignment before full admission to the program will be granted. 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. After one semester of graduate-level coursework has been completed, the student should work with the major professor to establish the advising committee. The major professor must approve the student's program each semester; therefore, the student is expected to maintain close consultation with the major professor and other members of the advising committee with regard to progress in the program. See Degree Requirements for more information about choosing an advising committee.

# DEGREE REQUIREMENTS

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## Master of Science

- Minimum Coursework: Core 15 hours
- Required (Major): 8 hours
- Thesis: 6 hours
- Electives: 1 hour
- **Total: 30 hours**

### Core Courses:

Cellular and Molecular Basis of Disease 541 (2 hours) & 542 (2 hours)  
Descriptive and Applied Epidemiology 504 (3 hours)  
Journal Clubs 600-level (4 hours)  
Statistics 500- or 600-level (3 hours)  
CEM Seminar 616 (1 hour)

- In addition to core courses, students must complete a minimum of 8 credit hours of coursework in a primary study area, 1 or more hours of electives, and 6 hours of Thesis 500.
  - Primary study area may include epidemiology, imaging, immunology, infectious diseases, medicine, molecular and cellular biology, nutrition and metabolism, oncology, parasitology, pathology, pharmacology, surgery, or toxicology. Exceptions to accommodate students with interests not listed above must be approved by the CEM program director after application, in writing. The purpose of the primary study area is to focus the student's final examination.
- A maximum of 6 hours of credit may be obtained from courses at the 400 level in which graduate credit is offered. In order to receive graduate credit, students must select "graduate" level upon registration AND must inform the instructor of the course 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.
- Students must complete an approved [responsible conduct of research](#) training program.

A majority of the total hours required for a master's degree must be taken at the University of Tennessee, Knoxville. Transferred courses must have been completed within the six-year period prior to receipt of the degree and must be approved by the student's committee and the Graduate School (see [transfer credits](#)). To be transferred into a master's program, a course must be taken for graduate credit, carry a grade of B or better, be a part of a graduate program in which the student had a B average, and not have been used for a previous degree. The courses must be listed on the Admission to Candidacy form and will be placed on the student's university transcript only after admission to candidacy. Thesis hours cannot be transferred.

### Master's Committee

Students must have identified a major professor upon entry into the CEM graduate program. **After one semester** of graduate-level courses, the student should select and consult with the major professor concerning the formation of a master's committee (at least three members at the rank of assistant professor or above). By the **end of the second semester**, the master's committee must be chosen.

**The committee must be** composed of the major professor, at least one faculty member from the College of Veterinary Medicine (which can include the major professor), and at least one faculty member from outside the major professor's academic unit. The student must submit a [Masters Committee Appointment Form](#), and the CEM program director must approve the master's committee to ensure that balance exists and that the CEM program is appropriately represented. If the student opts for a significant amount of coursework in a minor field of study, one member of the committee must be from an appropriate department in the minor discipline. The

committee will assist the student in planning a course of study prior to the end of the second semester of graduate-level work. The committee may require and/or recommend specific courses (in addition to those required by the program). The committee should aid the student in formulating and completing an appropriate research project and in ensuring the achievement of degree requirements. The student is responsible for coordinating meetings of the master's committee at least twice per year and obtaining and/or preparing required materials such as appropriate UT Graduate School forms, transcripts, yearly progress reports, and research proposals for the meetings. Student progress will be monitored by the CEM program director. It is incumbent upon students to promptly honor requests for progress reports.

## Admission to Candidacy

Admission to candidacy indicates agreement that the student has demonstrated ability to do acceptable graduate work and that satisfactory progress has been made toward a degree. This action usually connotes that all prerequisites to admission have been completed and a program of study has been approved. Application for admission to candidacy for the master's degree may be made after the student has completed required core courses and 9 hours of graduate coursework and has a minimum GPA of 3.0. Students must submit the [Admission to Candidacy form](#) (with original signatures) to the Graduate School (111 Student Services Building) no later than the last day of classes of the semester preceding the semester in which the student plans to graduate.

## Thesis Registration

Students must be registered for thesis hours each semester work is done on the thesis (continuous registration is not required), including a minimum of 3 credit hours the semester in which the thesis is accepted by the Graduate School. Six hours of course number 500 are required. After receiving the master's degree, a student is no longer permitted to register for 500-level thesis hours.

## Thesis

The thesis is the culmination of an original research project completed by the student.

- The final draft of the thesis must be distributed to all committee members **at least two weeks prior** to the date of the final examination.
- A draft of the thesis in electronic format must be submitted to the CEM program office **at least two weeks prior** to the final examination and be available to all interested persons at the University of Tennessee. It must be prepared according to the current edition of the [UTK Guide for the Preparation of Theses and Dissertations](#).
- ***Thesis preparation is the responsibility of the student*** (this includes typing).
- The thesis (prepared according to the regulations in the current edition of the [UTK Guide to the Preparation of Theses and Dissertations](#)) must be submitted to and accepted by the Graduate School and immediately thereafter electronically deposited to the Tennessee Research and Creative Exchange ([TRACE](#)). When students need to delay publication of a thesis because of academic/commercial publisher embargo policies, an [embargo option](#) is available.
- Each thesis must be accompanied by one original [approval sheet](#) (not a photocopy). The approval sheet must have the original signatures of all members of the masters committee, certifying that they have examined the final copy of the thesis and judged it to be satisfactory.

## Final Examination (Defense of Thesis)

Candidates must present a thesis seminar and pass a final oral examination, as determined by the candidate's committee. The examination, which covers both coursework and the thesis, measures the candidate's ability to integrate material in the primary study area and related fields. This examination must be scheduled by the student by submitting the [Scheduling Defense of Thesis form](#) through the CEM program office, ***at least two weeks prior to the examination***. Unless prior approval from the Graduate School is granted, the examination must be given in university facilities. Final examinations not properly scheduled **MUST** be repeated. This examination must be held at least two weeks before the final date set by the UT Graduate School for acceptance and approval of thesis. Results of the final examination must be submitted by the thesis deadline. In case of

failure, the candidate may not apply for re-examination until the following semester. The result of the second examination is final. Information about the appeals process may be found in the [Grievances and Appeals section](#).

The final examination should also fulfill the following CEM program guidelines:

- A seminar should be [scheduled](#) and presented by the student. This seminar should be announced through the CEM program office and be open to all interested persons at the university. Appropriate seminar announcements should identify this as a thesis defense.
- At the end of the presentation, questions shall be open to the audience and be appropriate to that presentation. 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.
- An oral defense of the thesis, by the student, will be conducted by the master's committee immediately following the seminar. The CEM program director is invited to attend.

### Transfer Credits

Courses taken at another institution may be considered for transfer into the MS degree program, as determined by the master's committee and by the Dean of the UT Graduate School. Official transcripts from all institutions previously attended must be sent directly to UT Graduate Admissions 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 University of Tennessee system cannot be used to meet thesis or dissertation requirements nor 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.

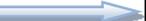
### Research Symposium Experience

Master's students are required to present at least once in the annual CEM Research Symposium, prior to defense of the thesis. In exceptional circumstances, the CEM program director may waive this requirement.

### Time Limit

Candidates have six (6) calendar years from the time of enrollment in the UT Graduate School to complete the master's degree. Students who change degree programs during this 6-year period may be granted an extension after review and approval by the UT Graduate School. In any event, courses used toward a master's degree must have been taken within six calendar years of graduation.

### Example Timetable for Completion of MS Degree

Year	1			2		
	Fall	Spring	Summer	Fall	Spring	Summer
Establish advising committee						
Submit progress report						
Submit Admission to Candidacy form						
Thesis hours						
Research Symposium experience <sup>†</sup>						
Final exam						

<sup>\*</sup>Assumes entry to program during fall semester and graduation during summer semester. Semesters should be adjusted according to when individual students entered program.

<sup>†</sup>Orange arrows indicate option of year in which to complete degree requirement.

## Master of Science – Forensic Odontology Concentration

This three-semester concentration is designed for anthropologists, dentists, registered dental hygienists, biologists, crime scene specialists, detectives, and medico-legal death investigators wishing introduction and formalization to skills in the search, recovery and collaborative identification of compromised human head and neck remains, and recognition of human and non-human bite marks at autopsy. This concentration is founded on the standards and guidelines established by the American Board of Forensic Odontology in the endeavors of human identification, bite mark investigation and analysis, dental age estimation, missing and unidentified persons, and mass fatality incident dental identification team development.

Training involves search, recovery, identification, and processing of fresh, mutilated, and decomposing and skeletal remains as evidence that has been exposed to many post-mortem environments from scattered and clandestine burials to aquatic and thermal contexts. Training will continue to include examination of those remains in the autopsy setting. Twice-monthly laboratory sessions at the Knox County Medical Examiner's Office – East Tennessee Regional Forensic Center will provide case work exposure. Training also involves recovery of relevant head and neck remains at an outdoor decomposition facility and processing for examination and report writing for submission as a defensible court document.

Applicants for the MS with a Forensic Odontology concentration must meet the minimum requirements for admission for the CEM program. For some students, prerequisite or concurrent coursework will likely be necessary to succeed in the course of study.

Students must meet all requirements for the MS degree in Comparative and Experimental Medicine. This includes courses CEM 504, CEM 541, CEM 542, four credit hours of journal clubs, and 500- or 600-level statistics. The CEM 504 course may be substituted with another relevant and appropriate course, as approved by the student's committee and the CEM program director. Although not required for forensic odontology students, presentation at the CEMPH Research Symposium, completion of responsible conduct of research training, and a yearly progress report are strongly encouraged. In lieu of a thesis, a capstone experience is required in which the student prepares an analytic 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 seminar, which is followed by an oral comprehensive exam by the student's committee.

### Forensic Odontology Course of Study

	Course	Credit hours
Fall	CEM 550: Introduction to Forensic Odontology	3
	CEM 541: Cellular and Molecular Basis of Disease	2
	Journal club	1
	CEM 554: Dental and Maxillofacial Anatomy/Histology	4 (3 lecture, 1 lab)
	CEM 504: Descriptive and Applied Epidemiology (optional)	3
Spring	CEM 552: Head and Neck Anatomy	4 (1 lecture, 3 lab)
	CEM 542: Cellular and Molecular Basis of Disease	2
	Statistics (500- or 600-level)	3
	Journal clubs	2
Summer or Fall	CEM 558: Laboratory Methods in Forensic Odontology	4 (1 lecture, 3 lab)
	CEM 556: Head and Neck Osteology and Trauma	4 (2 lecture, 2 lab)
	Journal club	1
	Capstone project (course optional)	1

## Capstone experience

The capstone should capture the spirit of the program in the form of either an original, applied primary research project; a theoretical or secondary research project; or a systematic review. It must be finalized during the last semester of study.

Through this experience, the student will demonstrate skills associated with the degree program, such as applied performance and critical analysis. Students must demonstrate their abilities to:

1. Gather material independently, as needed.
2. Think critically about and integrate the theoretical and/or practical knowledge that they have acquired throughout their studies.
3. Reflect on the ethical issues that are implicit in their project and/or their project's design.

What constitutes a sophisticated, integrative experience will vary with each student, since the coursework and subtheme undertaken are individual. Planning for this project should occur during the first semester and with the consultation of the committee, which must approve the project before work begins. In general, students develop ideas for their capstone based on coursework and/or interests. Examples of capstone experiences include an independent project, integrated case study or simulation, internship, practicum, original research project, or literature meta-analysis or systematic review.

The capstone project requirement may be met in **two** ways: The student may pass, with a B grade or better, a designated capstone course (this course may be substituted for CEM 504); however, course credits are not necessary for completion of the capstone project requirement. A more informal arrangement may satisfy the capstone requirement, as well. In either case, to satisfy the capstone requirement, the student must consult with the master's committee.

## Specifications

Comparative Aspect	Capstone Project	vs.	Master's Thesis
<i>Time Frame</i>	Two or three semesters.		Three to six semesters
<i>Length of Written Product</i>	~8 pages		75–150 pages (typically appx. 100 pages)
<i>Nature of Project</i>	Work-product demonstrates expertise in a narrow area. Should say much about a narrow topic.		Considers the topic in greater depth, more completely, and always involve basic or applied primary research.
<i>Oral Presentation/ Defense</i>	Neither the seminar nor the oral comprehensive exam should be a traditional defense of the paper.		Defense by committee and open to public.
<i>Professional Considerations</i>	<ul style="list-style-type: none"> <li>• Simulates settings often found on the job</li> <li>• Highlights an area of practical or theoretical importance to the field</li> </ul>		<ul style="list-style-type: none"> <li>• Helpful for students who intend to enter a PhD program and/or conduct individual research</li> <li>• Generally more rigorous; can be a good resume builder</li> </ul>
<i>Required Courses/Credit Hours</i>	Three special topics credit hours in one semester OR no credit hours.		Six thesis credit hours over two or more semesters.

## Paper

The research paper portion of the capstone experience should have a minimum length of 8 double-spaced pages (excluding figures and references).

## Seminar

The seminar will take place during the final semester of the program on or before the date set by the Graduate School for non-thesis programs. This examination must be scheduled by the student by submitting the Scheduling of Capstone Seminar form through the CEM program office, **at least two weeks prior to the examination**. The student should allow one hour for the seminar with the oral comprehensive examination to immediately follow.

### **Oral Comprehensive Exam**

The oral comprehensive examination with the committee will be approximately one hour and cover both the research paper and general knowledge within the concentration. The CEM program director is invited to attend.

### **Evaluation**

Students are expected to demonstrate good communication skills and a command of the subject area, including theoretical and applied knowledge.

### **Advice to Students**

Choose a topic about which you care deeply. You have the resources of a major research university at your disposal and you are mentored by a faculty committee. Think of the capstone experience as an exciting, pivotal project that might launch the next stage of your academic or professional life.

# Doctor of Philosophy

## Core Courses:

Cellular and Molecular Basis of Disease 541 (2 hours) & 542 (2 hours)  
Descriptive and Applied Epidemiology 504 (3 hours)  
Journal Clubs 600-level (6 hours)  
Statistics 500- or 600-level (3 hours)  
CEM Seminar 616 (1 hour)

In addition to core courses, students must complete a minimum of 8 credit hours of coursework in a primary study area. These 8 hours are considered part of the total required coursework. Primary study area may include epidemiology, imaging, immunology, infectious diseases, parasitology, medicine, molecular and cellular biology, nutrition and metabolism, pathology, pharmacology, toxicology, or surgery. Exceptions to accommodate students with interests not listed above must be approved by application, in writing, to the CEM program director. The purpose of the primary study area is to focus the student's comprehensive and final examinations.

Students must also complete an approved [responsible conduct of research](#) training program.

## Minimum coursework

For students with a professional (i.e., DVM, MD, DDS) or relevant master's degree: twenty-four (**24**) credit hours of graduate coursework. At least six hours of 600-level courses must be included, exclusive of dissertation hours. In addition, at least twenty-four (**24**) hours of dissertation work in course number 600 are required (forty-eight [**48**] hours total). At least 12 hours of coursework must be graded A-F.

Students without a professional or master's degree must complete a minimum of 48 credit hours of coursework and 24 hours of Dissertation 600. At least 30 hours of coursework must be graded A-F. A minimum of 6 hours of coursework must be taken in UT courses at the 600 level, exclusive of dissertation hours.

A maximum of 6 hours of credit may be obtained from courses at the 400 level in which graduate credit is offered. In order to receive graduate credit, students must select "graduate" level upon registration AND must inform the instructor of the course 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.

## Doctoral Committee

Students must have identified a major professor upon entry into the CEM graduate program. During the **first year** of graduate study, the student works with the major professor to identify a doctoral committee composed of a minimum of four faculty members holding the rank of assistant professor or above, three of whom, including the major professor, must be approved by the Graduate Council to direct doctoral research. At least one member must be from the College of Veterinary Medicine (this can include the major professor) and one member from an academic unit other than that of the student's major field. If a minor is declared, one member must have expertise in the minor discipline. The CEM program director must approve the doctoral committee to ensure that balance exists and that the CEM program is appropriately represented. Exceptions to these requirements, to accommodate students with specific interests, must be approved by application, in writing, to the CEM program director.

To officially establish the committee, the student must submit the [Doctoral Committee form](#) with original signatures to the Graduate School (111 Student Services Building) for final approval by the Dean of the Graduate School.

The doctoral committee has primary responsibility, subject to Graduate Council policies, for the degree work of the student. The doctoral committee should plan (and must approve) all coursework, certify the student's mastery of the subject matter of the field of study by a comprehensive examination, direct the research, and recommend the dissertation for approval and acceptance by the Graduate School. The doctoral committee should meet at least twice a year. The student shall declare, with approval of his/her doctoral committee and at the time of the student's first meeting with the committee, a [primary study area](#) and one to three **minor areas** supported by the expertise of the CEM faculty and agreed upon by the advising committee.

Students **prepare and defend a prospectus** outlining their proposed research projects before the end of their **third year** in the program. Medical residents pursuing a doctoral degree have until the end of their fourth year.

The *student's responsibility is to coordinate the scheduling of the meetings* of the doctoral committee and to obtain and/or prepare the materials required, such as appropriate Graduate School forms, transcripts, progress reports, and research proposals for committee meetings. The student's progress will be monitored by the CEM program director. It is incumbent upon students to promptly honor requests for progress reports.

*Changes in* membership of the doctoral committee **MUST** be done by submitting to the Graduate School a [Doctoral Committee form](#), with signatures of the members removed and added to the committee. The signature of the CEM program director is also required. The Admission to Candidacy application submitted by the student after completion of the comprehensive examination **MUST** have the signatures of members of the **CURRENT** doctoral committee.

## 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. Its 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 also 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. Information about the appeals process may be found in the [Grievances and Appeals](#) section of the student handbook.

The exam shall consist of two parts: 1) a written research proposal/grant application (in the format outlined below) and 2) an oral exam that assesses the general knowledge of the student in the field of primary study and serves as a defense of the written proposal. The exam should be carried out according to the following guidelines:

### Part 1 – Written Examination Submission and Approval of Exam Research Proposal Topic

Each student shall submit to his or her advisor a topic for a written grant proposal and a short statement defining the subject area (no more than 1 page in length). The proposal topic may be conceptually related to the student's intended doctoral research, but need not be identical in terms of experimental design. The student will have 4 weeks to submit the written proposal to the exam coordinator and committee members.

#### Format and submission of written research proposal

The proposal should adhere to the guidelines outlined below (similar to an NIH R21 or equivalent grant mechanism), including page restrictions.

- Standard Project Timeline: 2 years
- Style: Arial, Helvetica, Palatino Linotype, or Georgia typeface; black font color; at least 11-pt font Margins and 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 and 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.
  - A) **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.
  - B) **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.
  - C) **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 in this format (limited to 2 pages). 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.

## **Part 2 – Oral Examination**

Within 3 weeks after submitting the written examination, the student should sit for the oral examination with all committee members and the exam coordinator. The oral examination should be scheduled as early as possible, preferably when the student is notified to begin writing. The CEM program office is available to assist the student in securing an exam room once the committee, exam coordinator, and student have agreed upon a date and time for the exam. The student's oral exam will be closed-door with the student's committee members and exam coordinator (the CEM program director should also be invited). 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 prepare a summary of their grant proposal and give a brief (~10 minutes) presentation; they should also 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. The committee will convene immediately after the oral examination to determine if the student has successfully passed the oral exam. If the committee decides against a grade of pass for the oral exam, a time for reexamination (during the following semester and including a revision of the written proposal) should be scheduled before the end of the current semester. The exam coordinator should ensure that a short summary of the oral exam and a record of its outcome are filed in the CEM Program Office.

## Major Professor, Committee Members, & Exam Coordinator Roles & Responsibilities

The proposal must be written completely independently by the student. The mentor 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, and this assistance should be provided well in advance of the 4-week writing period.

### Exam coordinator

The CEM program director shall appoint a comprehensive examination coordinator by soliciting suggestions, from the student's major professor, of at least three CEM faculty members. The coordinator must be approved by the Graduate School to direct dissertations and must not be a member of the student's committee.

**The coordinator will ensure that all time restrictions and guidelines set forth herein are strictly adhered to by the student and committee members.** The oral examination shall be administered by the doctoral committee under the direction of the coordinator. The coordinator may participate in the examination and may vote on the outcome of the examination, if he or she chooses to do so.

### Assessment of written proposal

Each member of the committee shall evaluate the proposal. The exam coordinator should ensure that a copy of the written proposal is filed in the CEM Program Office, along with copies of the evaluations, and a short summary of the oral exam and a record of its outcome.

### Assessment of oral examination

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.

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

- a. A consensus exists among the examining committee members in favor of passing (at least a 2/3 majority on the committee, including the vote of the coordinator, if he or she chooses to vote).
- b. An appropriate number of questions dealing with the declared primary and minor study areas were administered.
- c. 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.

## Admission to Candidacy

A student may be admitted to candidacy for the doctoral degree after passing the comprehensive examination and maintaining at least a B average (minimum grade-point average of 3.0) in all graduate coursework. *Admission to candidacy must be applied for, and approved, at least one full term prior to the date the degree is to be conferred.* Each student is responsible for filing the [Admission to Candidacy form](#), which must be signed by the doctoral committee and the CEM program director and approved by the Graduate School.

## Dissertation ([UT Guide to Dissertation: http://web.utk.edu/~thesis/Guide11.pdf](http://web.utk.edu/~thesis/Guide11.pdf))

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. Funding for dissertation research will be identified by the student after consultation with the major professor. The student shall prepare, prior to initiation of the project, a prospectus to include title,

hypothesis, rationale, objectives, literature review, and materials and methods. The student's doctoral committee must approve the proposed research project in writing.

A student should be registered for the number of dissertation hours representing the fraction of effort devoted to this phase of the candidate's program. Thus, a student working full-time on the dissertation should register for 9 hours (6 hours for those on a half-time assistantship) of course number 600 per term.

The dissertation (prepared according to the regulations in the current edition of the [UTK Guide to the Preparation of Theses and Dissertations](#)) must be submitted to and accepted by the Graduate School and immediately thereafter deposited to the Tennessee Research and Creative Exchange ([TRACE](#)). When students need to delay publication of a dissertation because of academic/commercial publisher embargo policies, an [embargo option](#) is available. It must include an [approval sheet](#), signed by all members of the doctoral committee, which certifies to the Graduate School that they have examined the final copy and found that its form and content demonstrate scholarly excellence. All other doctoral forms are also submitted at this time (see [dissertation consultant](#) for details).

## Continuous Dissertation Registration

The student must register *continuously* for course number 600–Doctoral Research & Dissertation (minimum of 3 credit hours per semester) from the time the doctoral research proposal is approved by the committee, admission to candidacy is accepted, or registration of course number 600 is begun, whichever comes first. This includes summer semester and the semester in which the dissertation is approved and accepted by the Graduate School. To request a leave of absence from continuous registration of 600, the [leave of absence form](#) must be filled out and submitted to the Graduate School for approval. *A minimum of 24 credit hours of course number 600 is required before the dissertation will be accepted.*

## Final Examination (Defense of Dissertation)

A doctoral candidate must pass an oral defense of the dissertation. The dissertation, in the form approved by the major professor, *MUST be distributed to the committee at least two weeks before the examination.* The examination must be [scheduled](#) through the UT Graduate School at least one week prior to the examination and must be conducted in university facilities. Final examinations not properly scheduled must be repeated. 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 doctoral committee after completion of the dissertation and all course requirements. *This examination must be passed by a simple majority at least two weeks before the date of submission and acceptance of the dissertation by the Graduate School.* Results of the defense must be submitted by the dissertation deadline. Failure to pass the oral defense of dissertation may constitute dismissal from the program. Requests for second attempts must be sent to the CEM program director for review and approval/disapproval. In case of failure, the candidate may not apply for reexamination until the following semester. The result of the second examination is final. Appeal information may be found under "[Grievances and Appeal Procedures](#)" in the handbook.

The final examination should also fulfill the following CEM guidelines:

- A draft of the dissertation, paper or electronic file, shall be placed in the CEM program office one week prior to the final examination and be available to all interested persons at The University of Tennessee.
- A seminar shall 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 The University of Tennessee. 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 shall 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 doctoral committee immediately following the seminar. The CEM program director is invited to attend the oral defense.

## Transfer Credits

At the doctoral level, courses are not officially transferred, although they may be used to meet degree requirements. If a requirement has been met through coursework in another program, the student, in consultation with the committee, may petition the CEM program director for a waiver of this requirement. Courses taken at universities outside of the University of Tennessee system cannot be used to meet dissertation requirements nor 600-level coursework requirements.

## Research Symposium Experience

Doctoral students are required to present at least twice in the CEM Research Symposium, prior to defense of the dissertation. In exceptional circumstances, the CEM program director may waive this requirement.

## Time Limit

Comprehensive examinations must be successfully completed within 5 years, and all requirements must be completed within 8 years from the time of a student's initial enrollment in the doctoral degree program.

## Residence Requirement

For a doctoral degree, a minimum of two consecutive semesters (summer included) of residency is required. Residency is defined as full-time registration for a given semester on the campus where the program is located.

## Example Timetable for Completion of PhD Degree

Year	1			2			3			4		
Semester*	Fall	Spr	Sum									
Establish advising committee		→										
Submit progress report			→			→			→			
Prepare and defend prospectus†							→					
Take comprehensive examination							→					
Submit Admission to Candidacy form										→		
Dissertation hours							→					
Research Symposium experience‡						→			→			→
Schedule and take final exam												→

\*Assumes entry to program during fall semester and graduation during summer semester. Semesters should be adjusted according to when individual students entered program.

†Medical/clinical residents pursuing a doctoral degree have until the end of their 4th year and should adjust timetable accordingly.

‡Orange arrows indicate option of which *two* years in which to complete degree requirement.

## PhD with Concurrent MS Degree

The CEM program offers the PhD with a concurrent MS degree option for doctoral students who plan to complete the master's degree in CEM while maintaining enrollment in the doctoral program. 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 a student wishes to complete an MS in one primary study area [ex: immunology] and a PhD in another [ex: virology]).

Students must submit a [Request for Concurrent Master's Degree form](#) to the Graduate School (111 Student Services Building) two weeks prior to the deadline for submission of the graduation application for the master's degree. No fee will be assessed for submission of this form.

Preferably, the student will decide the path (see below) upon entrance into the PhD program. Students who have already completed a master's degree in a similar program elsewhere will continue to be admitted directly into the PhD-only program.

**Path 1: MS with thesis; PhD with dissertation**

Students will progress through the MS program and complete a thesis and oral defense before attempting the PhD comprehensive examination and completing the dissertation (and oral defense). Six hours of thesis and 24 hours of dissertation are required.

**Path 2: MS with problems in lieu of thesis option; PhD with dissertation**

Students will progress through the MS program with 6 course hours in CEM 501 (Special Topics in Comparative and Experimental Medicine), CEM 510 (Graduate Research Participation), or CEM 515 (Current Topics in Comparative and Experimental Medicine), 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 proposal before completing the dissertation (and dissertation oral defense).

## Dual DVM-PhD

The UT College of Veterinary Medicine and the CEM graduate program offer a coordinated accelerated dual program leading to the conferral of both the Doctor of Veterinary Medicine and the Doctor of Philosophy degrees. The accelerated dual program allows veterinary students to apply up to 9 hours of DVM coursework toward a PhD degree in CEM, leading to completion of both degrees in less time than would be required to earn both degrees independently. The accelerated program is designed to prepare highly motivated students for a career in veterinary research.

Students entering the dual degree program must meet minimum admission requirements for both the DVM and the PhD programs. Applicants for the DVM-PhD 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 accepted by the College of Veterinary Medicine may apply for approval to pursue the dual program 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 DVM-PhD program will be officially classified as primarily veterinary (DVM-seeking) students until the DVM coursework is completed, with the following exception: dual program students will typically be expected to enroll as PhD students during the summer semesters after their first and second years in the veterinary curriculum. After the DVM is conferred, the dual student's primary major will be CEM.

A dual program candidate must satisfy the graduation requirements of each program. The CEM program will award up to 33 hours of credit toward the PhD for acceptable performance (a grade of at least a "B" in A-F-graded courses) in approved courses offered by the College of Veterinary Medicine. Courses eligible for dual credit will be at the recommendation of the student's CEM major professor in consultation with the student's doctoral committee. A total of 48 course hours independent of dissertation (CEM 600) are required for the PhD degree (15 CEM hours plus 33 hours accepted from the DVM program). The doctoral comprehensive examination must be successfully completed within 2 years of completing all DVM coursework.

# ACADEMIC STATUS

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## Full-Time Status

To be considered full-time, students should enroll in at least 9 credit hours, but no more than 15 hours, per semester. For the summer semester, students may register for a maximum of 12 hours in an entire summer semester or 6 hours in a 5-week summer session. Students may enroll in only one course during mini-term.

Students holding a half-time assistantship should enroll for 6 to 11 credit hours. A one-fourth time graduate assistant should take 9 to 13 hours.

If students hold at least a one-fourth time assistantship appointment, they are automatically enrolled in the student health insurance plan. However, students must be enrolled in at least 3 graduate credit hours each term to maintain coverage. If they wish to use the on-campus Student Health Center, students must be enrolled for at least 9 hours per semester **or** pay the health fee if enrolled for less than 9 hours.

## Grade-Point Average

Graduate students must maintain a cumulative grade-point average (GPA) of at least 3.0 in all graduate courses taken for a letter grade of A to F. Grades of S/NC, P/NP, and I, which have no numerical equivalent, are excluded from this computation. No student may repeat a course for the purpose of raising a grade already received, with the exception of NC. A graduate student may not do additional work or repeat an examination to raise a final grade.

## Terms of Academic Probation

If, upon completion of 9 hours of graduate coursework, a student's GPA falls below 3.0, the student will be placed on academic probation. A student will be allowed to continue graduate study in subsequent semesters if each semester's GPA is 3.0 or greater. Upon achieving a cumulative GPA of 3.0, the student will be removed from probationary status.

## Dismissal

If a student is on academic probation, the degree status will be terminated by the Graduate School if the student's semester GPA falls below 3.0 in a subsequent semester. When the particular circumstances may be deemed to justify continuation, and upon recommendation by the CEM program director and approval of the Graduate School, a student on probation whose term GPA is below 3.0 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 CEM program director and reviewed by the CEM Admissions & Academic Progress Committee 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 Thesis 500/Dissertation 600.

Termination of a student from the CEM program must be accompanied by written notice to the student with a copy to the Graduate School. The CEM program director may 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 CEM program director.

## Incomplete Grades

"I" is a temporary grade indicating that the student has done satisfactorily in the course but, due to unforeseen circumstances, has been unable to complete all the requirements.

All incompletes MUST be removed within one calendar year of the assignment of the incomplete. If a supplementary grade report has not been received in the UT Registrar's Office at the end of the appropriate semester, the "I" will be changed to an "F." The course will not be counted in the cumulative grade-point average until a final grade is assigned. No student may graduate with an "I" on his/her record. If a student receives an "I," it is his or her responsibility to contact the instructor and find out what work remains to complete the course.

## Method/Time Frame for Notification of "Change of Program"

To change a major program of study or to change from one degree to another within the same program, a student must submit a [Request for Change of Graduate Program](#) via the online admission application. Acceptance into a new program is contingent upon a review and recommendation by that program. Students not accepted into the program requested remain in the program to which he/she has been formerly admitted. Results of each request for program change are communicated to the student by mail by the Graduate School. Program changes must be accomplished within one semester of the request for change.

## Expectations for Good Standing

Students in the CEM program are expected to maintain a 3.0 cumulative grade-point average 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 or dissertation research after projects have been approved. The CEM program has a formal process for annual evaluation of student progress and performance ([https://vetmed.tennessee.edu/research/Pages/gp\\_current\\_students.aspx](https://vetmed.tennessee.edu/research/Pages/gp_current_students.aspx)). The process is designed to optimize the value of individual student programs and to ensure timely progression through degree requirements.

## Yearly Progress Report

Following each spring 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. The major professor provides copies of the evaluation to the members of the student's committee and to the CEM program director.

Following the major professor's evaluation and prior to the start of the fall semester, the student must submit an [information packet](#) to the CEM program director's 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 CEM program director 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.

## 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 CEM program director. If all efforts fail and the professor decides to stop serving as the student's major professor, that professor documents in writing all problems and attempts to make corrections to the student, the student's committee members, and the CEM program director. Conversely, students may similarly request changes. Under either scenario, to remain in the program, the student must provide to the CEM program director 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 CEM program director will notify the student, the major professor, and the student's advising committee of his or her 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.

## ACADEMIC HONESTY

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### Expectations

Plagiarism or academic cheating of any description (during closed-book examinations, thesis 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 CEM program director. The student will be notified, in writing, of the charge(s) by the Committee within 7 days of the latter receiving the charge. The CEM program director 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.

### Appeal

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](#).

## LEGAL REQUIREMENTS FOR RESEARCH

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Institutions of higher education have maintained a centuries-old tradition of integrity and objectivity. The University of Tennessee 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 he or she has 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 shall 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 the University of Tennessee are expected to comply with the university's research policies, regulations, and guidelines. [Information](#) and required forms are available at the Office of Research. Regulations must be followed for all research, especially that involving animal care, biosafety, human subjects, and radiation.

It is recommended that all students in the CEM program complete training in the responsible conduct of research during their first year of study, and all students must complete this training within their first 2 years. Training may be acquired by completing any one of the following three options:

1. Satisfactory completion of an approved online training module.
  - a. [Collaborative Institutional Training Initiative](#) (UTIA or UTHSCK; *recommended*)
2. Graduate course
  - a. CEM 525: Research Ethics for the Life Sciences (*recommended*)
  - b. Others, as they become available and are approved by the Curriculum Committee
3. Student-Mentor training plan (see [yearly progress report form](#) for details)

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. This should document instruction in the topics addressed in the core training provided under the approved options listed above (1a or 2a).

## CONFLICTS OF INTEREST

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1. 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 do this, 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.
2. 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.
3. Students should not give gifts to faculty in the CEM program, including their own major professor, before they have 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.

## GRIEVANCES AND APPEALS PROCEDURES

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A graduate student may appeal two types of academic decisions (in addition to [academic dishonesty](#)):

1. Academic performance evaluations
2. Decisions based on race, gender, religion, national origin, age, sexual orientation, or handicap

Graduate students and faculty should first try to resolve the matter through informal discussions. If a satisfactory resolution is not met, the individual should file a grievance in writing to the CEM program director. If applicable, any person accused in the grievance must be notified, in writing, by the CEM program director 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 CEM program director shall work with the student to appoint a three-member panel composed of faculty who are not involved in the dispute. The panel shall render a decision within 30 working days of receiving the grievance, unless an extension requested by any of the parties involved is approved. If any party is not satisfied by the decision of the panel, further [appeals](#) may be made to the university's Graduate Council Appeals Committee. For all other problems students may encounter related to their graduate studies that they feel cannot be addressed by or to their mentor and committee, students are strongly encouraged to seek guidance/help from CEM program staff or program director.

## CEM COURSE LISTINGS

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CEM students are not restricted to registration only within the CEM course listings and are expected to enroll in courses outside the program. Approximately one month before each semester begins, students are given a comprehensive listing of potential courses from across the Knoxville-area campuses.

*Codes for course offerings:* E, offered every semester; F, offered in the fall semester; Sp, offered in the spring; Sum, offered in the summer; A, offered in alternate years; Odd, offered in odd-numbered years (e.g., 2017); Even, offered in even-numbered years (e.g., 2016).

**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. *Satisfactory/No Credit grading only. May be repeated. Maximum 6 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. *F*

**506 – One Health (2).** 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. *Sp, Sum*

**507 – Epidemiology of Vector-Borne, Bacterial, and Viral Zoonotic Diseases (2).** 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. Sum, Odd*

**508 – Epidemiology of Parasitic, Foodborne, and Bacterial Zoonotic Diseases (2).** 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. Sum, Even*

**510 – Graduate Research Participation (3).** Advanced research techniques while conducting individual biomedical research projects under supervision of faculty. *Satisfactory/No Credit grading only. May be repeated. Maximum 9 hours. Consent of instructor. E*

**515 – Current Topics in Comparative and Experimental Medicine (1–6).** Specialized experience in comparative and experimental medicine. *A–F grading. May be repeated. Maximum 6 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. *F*

**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. *F, Even*

**531 – Wildlife Medicine: Conservation and Policy (2-3).** Cross-listed: (Veterinary Medicine 820). 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 hours. Comment(s): Veterinary Medicine students may count the course only once (either 2 or 3 hours) toward degree requirements. Registration Permission: Consent of instructor. Sp*

**541 – Cellular and Molecular Basis of Disease (2).** 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, muscular, bone, respiratory, hematology. *Prerequisite: Biochemistry and Cellular and Molecular Biology 419. F, Thur 8–10*

**542 – Cellular and Molecular Basis of Disease (2).** 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: renal, liver/pancreas, metabolism, endocrinology, reproduction, immunology. *Prerequisite: Biochemistry and Cellular and Molecular Biology 419. Sp, Thur 8–10*

**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. F, Odd*

**550 – Introduction to Forensic Odontology (3).** Development of the discipline within a medico-legal context. From crime scene to positive identification to courtroom, dental remains as evidence are studied from a historic to current approach using taphonomic, radiographic, histologic, pathologic, and anthropologic perspectives. *Consent of instructor. F*

**552 – Head and Neck Anatomy (4).** Detailed gross dissection of the human head and neck with traditional musculo-skeletal and neuro-vascular emphasis. *1 hour lecture and 3 hours lab per week. Consent of instructor. Sp*

**554 – Dental and Maxillofacial Anatomy/Histology (4).** Human dento-facial embryology, odontogenesis, mineralized tissue histology and dental morphology. *3 hours lecture and 1 hour lab per week. Consent of instructor. F*

**556 – Head and Neck Osteology and Trauma (4).** Detailed neuro- and viscero-cranial osteology, including embryology, post-natal facial growth and development, aging and degenerative pathology, and perimortem trauma. *2 hours lecture and 2 hours lab per week. Prerequisite: CEM 552. Consent of instructor. Sum*

**558 – Laboratory Methods in Forensic Odontology (4)** Instruction in oral autopsy procedures, preparation of crime scene or autopsy-related evidence, preparation of gross specimens and analysis, charting of dentitions, photography and radiography of dentitions, report writing for legal medicine, and dissection and light microscopy of tissues for reports and courtroom testimony. *1 hour lecture and 3 hours lab per week. Consent of instructor. Sum*

**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. *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 and statistics courses. Consent of instructor is suggested. Sp, Even*

**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. Sum, Even*

**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. *Satisfactory/No Credit. May be repeated. Maximum 12 hours. E*

**611 – Journal Club in Emerging Infectious Diseases (1).** Readings and discussions based on current literature. *Satisfactory/No Credit grading only. May be repeated. Maximum 12 hours. F, Sp*

**612 – Journal Club in Biomedical and Diagnostic Sciences (1).** Readings and discussions based on current literature. *Satisfactory/No Credit grading only. May be repeated. Maximum 12 hours. E*

**613 – Journal Club in Large Animal Clinical Sciences (1).** Readings and discussions based on current literature. *Satisfactory/No Credit grading only. May be repeated. Maximum 12 hours. E*

**614 – Journal Club in Small Animal Clinical Sciences (1).** Readings and discussions based on current literature. *Satisfactory/No Credit grading only. May be repeated. Maximum 12 hours. Must have DVM or equivalent degree. E*

**615 – Journal Club in Comparative and Experimental Medicine (1).** Readings and discussions based on current literature. *Satisfactory/No Credit grading only. May be repeated. Maximum 12 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 hours. Maximum 3 hours may be applied toward degree requirements. F, Sp, Mon 12–1*

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

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

**650 – Surgical Pathology (1-2).** Examination of biopsy specimens and interpretation of observations. Preparation of specimens for sectioning. *May be repeated. Maximum 3 hours. Consent of Instructor. 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 hours of physiology. Sp, Even*

# GRADUATE FACULTY

## College of Veterinary Medicine

### Biomedical and Diagnostic Sciences

**Bemis, David – PhD (Prof)**

<https://vetmed.tennessee.edu/FacultyStaff/SitePages/CVMProfile.aspx?NetID=bemis>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Diagnostic bacteriology/mycology, bacterial pathogenesis, Bordetella

**Cox, Sherry – MS, PhD (Clinical Prof)**

[http://works.bepress.com/sherry\\_cox/](http://works.bepress.com/sherry_cox/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Pharmacology

**Cui, Mei-Zhen – PhD (Prof)**

<https://vetmed.tennessee.edu/FacultyStaff/SitePages/CVMProfile.aspx?NetID=cui>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Molecular mechanisms of Cardiovascular disease

**Donnell, Robert – DVM, PhD (Assoc Prof)**

[http://works.bepress.com/robert\\_donnell/](http://works.bepress.com/robert_donnell/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Pathogenesis of amyloid formation, deposition and clearance via use of transgenic models, development of antibodies and clinical evaluation of novel approaches

**Eiler, Hugo – DVM, MS, PhD (Prof)**

[http://works.bepress.com/hugo\\_eiler/](http://works.bepress.com/hugo_eiler/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Endocrine testing procedures; mechanism and treatment for retained placenta

**Fecteau, Kellie – MS, PhD (Clin Assoc Prof)**

<https://vetmed.tennessee.edu/FacultyStaff/SitePages/CVMProfile.aspx?NetID=kfecteau>

Approved to Direct Doctoral Research: N

**Research Emphasis:** Clinical endocrinology

**Flatland, Bente – DVM (Assoc Prof)**

<https://vetmed.tennessee.edu/FacultyStaff/SitePages/CVMProfile.aspx?NetID=bflatlan>

Approved to Direct Doctoral Research: N

**Research Emphasis:** Clinical pathology quality management, method validation/comparison, point-of-care testing, coagulation, hematology, chemistry of stains and staining, diagnostic cytology

**Fry, Michael – MS, DVM (Prof)**

[http://works.bepress.com/michael\\_fry/](http://works.bepress.com/michael_fry/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Canine hepcidin, reticulocyte indices as markers of iron deficiency

**Gerhold, Richard – DVM, PhD (Asst Prof)**

[http://works.bepress.com/richard\\_w\\_gerhold/](http://works.bepress.com/richard_w_gerhold/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Wildlife and public health-associated parasite epidemiology; protozoa and tick-borne diseases

**Kania, Stephen – MS, PhD (Prof)**

[http://works.bepress.com/stephen\\_kania/](http://works.bepress.com/stephen_kania/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Immunology and diagnosis of infectious diseases, microbial molecular diversity, and mechanisms of bacterial virulence

**Kennedy, Melissa – DVM, PhD (Assoc Prof)**

[http://works.bepress.com/melissa\\_kennedy/](http://works.bepress.com/melissa_kennedy/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Coronavirus, infections in felidae, viral diseases of non-domestic species

**Martin-Jimenez, Tomas – DVM, PhD (Assoc Prof)**

[http://works.bepress.com/tomas\\_martin-jimenez/](http://works.bepress.com/tomas_martin-jimenez/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Pharmacology

**McEntee, Michael – DVM (Prof & Dept Head)**

<https://vetmed.tennessee.edu/FacultyStaff/SitePages/CVMProfile.aspx?NetID=mmcentee>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Gross, histologic, and ultrastructure and ultrastructural pathology

**Miller, Debra – DVM, PhD (Prof)**

<http://fwf.ag.utk.edu/personnel/dmiller.htm>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Amphibian diseases; Leatherback sea turtle and marine and Arctic mammal pathology

**Newkirk, Kim – DVM, PhD (Assoc Prof)**

[http://works.bepress.com/kim\\_newkirk/](http://works.bepress.com/kim_newkirk/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Mouse models of human disease; mouse phenotyping

**Odoi, Agricola – MS, PhD** (Assoc Prof)  
[http://works.bepress.com/agricola\\_odoi/](http://works.bepress.com/agricola_odoi/)  
Approved to Direct Doctoral Research: Y  
**Research Emphasis:** Applications of GIS & spatial epidemiology in health research & practice; zoonotic infections of public health significance; determinants of population health

**Okafor, Chika – DVM, MS, PhD** (Asst Prof)  
[https://vetmed.tennessee.edu/home/Pages/faculty\\_staff\\_details.aspx?NetID=cokafor2](https://vetmed.tennessee.edu/home/Pages/faculty_staff_details.aspx?NetID=cokafor2)  
Approved to Direct Doctoral Research: Y  
**Research Emphasis:** Qualitative veterinary epidemiology and public health; food safety in foods of animal origin

**Reed, Robert – DVM, PhD** (Assoc Prof)  
<https://vetmed.tennessee.edu/FacultyStaff/SitePages/CVMProfile.aspx?NetID=rbreed>  
Approved to Direct Doctoral Research: Y  
**Research Emphasis:** Nutritional regulation of LHRH and LH secretion and effects on the reproductive axis; Macroscopic and applied anatomy of domestic and exotic species

**Rouse, Barry – DVM, MSc, PhD** (Prof)  
<https://vetmed.tennessee.edu/FacultyStaff/SitePages/CVMProfile.aspx?NetID=btr>  
Approved to Direct Doctoral Research: Y  
**Research Emphasis:** Comparative cellular and molecular immunology; viral infection diseases

**Schaefer, Deanna – DVM, MS, MT(ASCP)** (Asst Prof)  
[https://vetmed.tennessee.edu/home/Pages/faculty\\_staff\\_details.aspx?NetID=dschaefer](https://vetmed.tennessee.edu/home/Pages/faculty_staff_details.aspx?NetID=dschaefer)  
Approved to Direct Doctoral Research: N  
**Research Emphasis:** Hematopathology; comparative hematology; iron metabolism

**Schuller, Hildegard – DVM, PhD** (Prof)  
[http://works.bepress.com/hildegard\\_schuller/](http://works.bepress.com/hildegard_schuller/)  
Approved to Direct Doctoral Research: Y  
**Research Emphasis:** Experimental oncology, chemical carcinogenesis; comparative pathology of lung tumors

**Souza, Marcy – DVM, MPH** (Assoc Prof)  
[http://works.bepress.com/marcy\\_souza/](http://works.bepress.com/marcy_souza/)  
Approved to Direct Doctoral Research: Y  
**Research Emphasis:** Infectious diseases; zoonoses of wildlife and exotic pets

**Thompson, Sharon – DVM, MPH** (Clin Assoc Prof)  
<http://www.vet.utk.edu/cafsp/contacts.php>  
Approved to Direct Doctoral Research: N  
**Research Emphasis:** Food safety and defense

**Wang, Hwa-Chain Robert – BVM, PhD** (Prof)  
[http://works.bepress.com/hwa-chain\\_wang/](http://works.bepress.com/hwa-chain_wang/)  
Approved to Direct Doctoral Research: Y  
**Research Emphasis:** Anti-cancer molecular oncology

**Xu, Xuemin – PhD** (Prof)  
[http://works.bepress.com/xuemin\\_xu/](http://works.bepress.com/xuemin_xu/)  
Approved to Direct Doctoral Research: Y  
**Research Emphasis:** Molecular mechanisms of Alzheimer's disease

## Large Animal Clinical Sciences

**Adair, Henry S – DVM, MS** (Assoc Prof)

[http://works.bepress.com/henry\\_adairiii/](http://works.bepress.com/henry_adairiii/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Equine laminitis; laser Doppler flowmetry; microvascular blood flow and laser surgery

**Anderson, David – DVM, MS** (Prof & Dept Head)

[http://works.bepress.com/david\\_anderson1/](http://works.bepress.com/david_anderson1/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Bovine pain and welfare; ruminant surgery; animal models for human research

**Caldwell, Marc – DVM, PhD** (Asst Prof)

[https://works.bepress.com/marc\\_caldwell/](https://works.bepress.com/marc_caldwell/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Infectious diseases of food animals with particular focus on bacterial pathogenesis and host-pathogen interactions

**Dhar, Madhu – PhD** (Res Assoc Prof)

[http://works.bepress.com/madhu\\_dhar/](http://works.bepress.com/madhu_dhar/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Mouse models of human disease: obesity and diabetes

**Seddighi, M. Reza – DVM, PhD** (Assoc Prof)

[http://works.bepress.com/reza\\_seddighi/](http://works.bepress.com/reza_seddighi/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Pharmacokinetics and dynamics of analgesics and anesthetics

**Whitlock, Brian – DVM** (Assoc Prof)

[http://works.bepress.com/brian\\_whitlock/](http://works.bepress.com/brian_whitlock/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Reproductive physiology and endocrinology; interaction of metabolic and reproductive systems

## Small Animal Clinical Sciences

**Cekanova, Maria – PhD, MS, RNDr** (Res Assoc Prof)

[http://works.bepress.com/maria\\_cekanova/](http://works.bepress.com/maria_cekanova/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Metabolism, tumorigenesis, adult mesenchymal stem cells, imaging technology

**Egger, Christine – DVM** (Prof)

[http://works.bepress.com/christine\\_egger/](http://works.bepress.com/christine_egger/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Acute and chronic pain; acupuncture in treatment of pain

**Frank, Linda – DVM, MS** (Prof)

[http://works.bepress.com/linda\\_frank/](http://works.bepress.com/linda_frank/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Hypothyroidism in dogs, pathophysiology of atopic dermatitis

**Hecht, Silke – DMV** (Prof)

[http://works.bepress.com/silke\\_hecht/](http://works.bepress.com/silke_hecht/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Small animal ultrasonography; neuroimaging; CT and MRI; excretory renal scintigraphy

**Hendrix, Diane – DVM** (Prof)

[http://works.bepress.com/diane\\_hendrix/](http://works.bepress.com/diane_hendrix/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Infectious disease of the equine cornea; raptor ophthalmology

**Jones, Michael – DVM** (Prof)

[http://works.bepress.com/michael\\_jones2/](http://works.bepress.com/michael_jones2/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Avian medicine

**Mawby, Dianne – DVM** (Clinical Prof)

[http://works.bepress.com/dianne\\_mawby/](http://works.bepress.com/dianne_mawby/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Internal medicine

**Millis, Darryl – DVM, MS** (Prof)

[http://works.bepress.com/darryl\\_millis/](http://works.bepress.com/darryl_millis/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Effects of growth factors on bone healing; canine gait analysis

**Morandi, Federica – DVM, MS** (Prof)

[http://works.bepress.com/federica\\_morandi/](http://works.bepress.com/federica_morandi/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** CT; nuclear Medicine; PET

**Ramsay, Edward – DVM** (Prof)

[http://works.bepress.com/edward\\_ramsay/](http://works.bepress.com/edward_ramsay/)

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Novel anesthetic agent delivery; immobilization of wildlife; reptile clinical pathology

**Weigel, Joseph – DVM, MS** (Assoc Prof)

[http://works.bepress.com/joseph\\_weigel/](http://works.bepress.com/joseph_weigel/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Orthopedics

**Whittemore, Jacqui – DVM, PhD** (Assoc Prof)

[http://works.bepress.com/jacqueline\\_c\\_whittemore/](http://works.bepress.com/jacqueline_c_whittemore/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Vaccine-associated immune disorders; pancreatic and liver disorders; non-invasive interventional techniques

**Witzel, Angela – DVM, PhD** (Asst Prof)

[http://works.bepress.com/angela\\_witzel/](http://works.bepress.com/angela_witzel/)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Veterinary nutrition

# UT Graduate School of Medicine

**Datta, Subimal – PhD** (Prof – UTK Dept of Psychology;  
UTGSM Dept of Anesthesiology)

<http://psychology.utk.edu/faculty/datta.php>

<http://gsm.utmck.edu/anesthesiology/faculty/datta.cfm>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Cellular and molecular mechanisms of sleep-wake states, sleep-dependent memory processing, states of consciousness, and anxiety disorders

**Gerard, David – PhD** (Prof – Dept of Oral/Max Surgery)

[http://gsm.utmck.edu/oral\\_surg/faculty/gerard.cfm](http://gsm.utmck.edu/oral_surg/faculty/gerard.cfm)

Approved to Direct Doctoral Research: N

**Research Emphasis:** Study of bone activity in response to implanted materials and bone response to growth factors

**Goldman, Mitchell – MD** (Prof – Dept of Surgery)

<http://gsm.utmck.edu/surgery/faculty/goldman.cfm>

Approved to Direct Doctoral Research: N

**Research Emphasis:** Vascular/transplant surgery

**Grandas, Oscar – MD** (Prof – Dept of Surgery)

<http://gsm.utmck.edu/surgery/faculty/grandas.cfm>

Approved to Direct Doctoral Research: N

**Research Emphasis:** Pancreas transplantation

**Karlstad, Michael D. – PhD** (Prof – Dept of Surgery)

[http://www.researchgate.net/profile/Michael\\_Karlstad](http://www.researchgate.net/profile/Michael_Karlstad)

Approved to Direct Doctoral Research: N

**Research Emphasis:** The regulation of pulmonary inflammation and protein metabolism by protein and lipid mediators in critical illness and trauma

**Kennel, Stephen – PhD** (Assoc Prof – Dept of Medicine)

<http://gsm.utmck.edu/internalmed/faculty/kennel.cfm>

Approved to Direct Doctoral Research: N

**Research Emphasis:** Human immunology & cancer

**Marks, Murray K – PhD** (Assoc Prof – Depts of Oral & Maxillofacial Surgery and Pathology)

<http://gsm.utmck.edu/dentistry/faculty/marks.cfm>

Approved to Direct Doctoral Research: N

**Research Emphasis:** Mineralized tissue biology and histology; dental enamel histopathology; skeletal trauma histology; fetal dental development, human identification/forensic anthropology

**Mountain, Deidra – PhD** (Assoc Prof – Dept of Surgery)

<http://gsm.utmck.edu/surgery/faculty/mountain.cfm>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Vascular/transplant surgery

**Terry, Paul – PhD, MPH** (Assoc Prof – Dept of Medicine)

<http://gsm.utmck.edu/internalmed/faculty/terry.cfm>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Epidemiology

**Wall, Jonathan S. – PhD** (Prof – Dept of Medicine)

<http://gsm.utmck.edu/internalmed/faculty/wall.cfm>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Amyloid and other abnormal protein assemblies

## Public Health, Nutrition, Entomology & Plant Pathology

**Brown, Kathleen C. – PhD, MPH** (Assoc Prof)

<http://publichealth.utk.edu/personnel/chen/chen.html>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Health issues and how they affect the overall quality of life and health of the community

**Chen, Jiangang (Jay) – MM, PhD** (Assoc Prof)

<http://publichealth.utk.edu/personnel/chen/chen.html>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Impacts of environmental toxicants on development and reproductive function

**Kintziger, Kristina W. – PhD, MPH** (Asst Prof)

<http://publichealth.utk.edu/people/kintziger/>

Approved to Direct Doctoral Research: N

**Research Emphasis:** Understanding the vulnerabilities and the current and future disease burden associated with climate-sensitive hazards, as well as understanding the relationship between morbidity/mortality and social determinants of health.

**Raynor, Hollie – PhD, MS** (Prof)

<http://nutrition.utk.edu/peopletwo/hollie-raynor/>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** Lifestyle interventions, designed to improve eating and leisure-time activity behaviors, for obesity treatment in children and adults; examining environmental dietary factors, such as portion size, variety, and energy-density, which influence food consumption

**Trout Fryxell, Rebecca – MS, PhD** (Asst Prof)

<https://ag.tennessee.edu/EPP/Pages/Fryxell.aspx>

Approved to Direct Doctoral Research: Y

**Research Emphasis:** 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; and developing and evaluating novel methods for vector management and disease suppression

### Pertinent Graduate Student Web Pages

- Application for Admission
  - <http://gradschool.utk.edu/admissions/>
- Best Practices in Teaching
  - <http://gradschool.utk.edu/training-and-mentorship/bpit/>
- Center for International Education
  - <http://cie.utk.edu/>
- Comparative and Experimental Medicine
  - [https://vetmed.tennessee.edu/research/Pages/Graduate\\_Program.aspx](https://vetmed.tennessee.edu/research/Pages/Graduate_Program.aspx)
- Counseling Center
  - <http://counselingcenter.utk.edu/>
- Funding, Fellowships, Assistantships for Graduate Students
  - <http://gradschool.utk.edu/graduate-student-life/costs-funding/>
- Graduate School
  - <http://gradschool.utk.edu>
- Graduate Catalog
  - <http://catalog.utk.edu/index.php>
- Graduate Student Appeals Procedure
  - <http://gradschool.utk.edu/faculty-staff/graduate-council/>
- Graduate Student Senate
  - <http://gss.utk.edu/>
- Graduate Admissions
  - <http://gradschool.utk.edu/admissions/>
- Housing
  - <http://housing.utk.edu/>
- International House
  - <http://ihouse.utk.edu/>
- Office of Student Conduct and Community Standards
  - <http://studentconduct.utk.edu/>
- Library Web site for Graduate Students
  - <http://libguides.utk.edu/graduate>
- Office of Equity and Diversity
  - <http://oed.utk.edu>
- Office of Multicultural Student Life
  - <http://multicultural.utk.edu/>
- Office of Information Technology (OIT)
  - <https://oit.utk.edu/>
- Research Compliance/Research with Human Subjects
  - <http://research.utk.edu/compliance/>
- Thesis/Dissertation Web site
  - <http://web.utk.edu/~thesis>

## Forms and Additional Resources