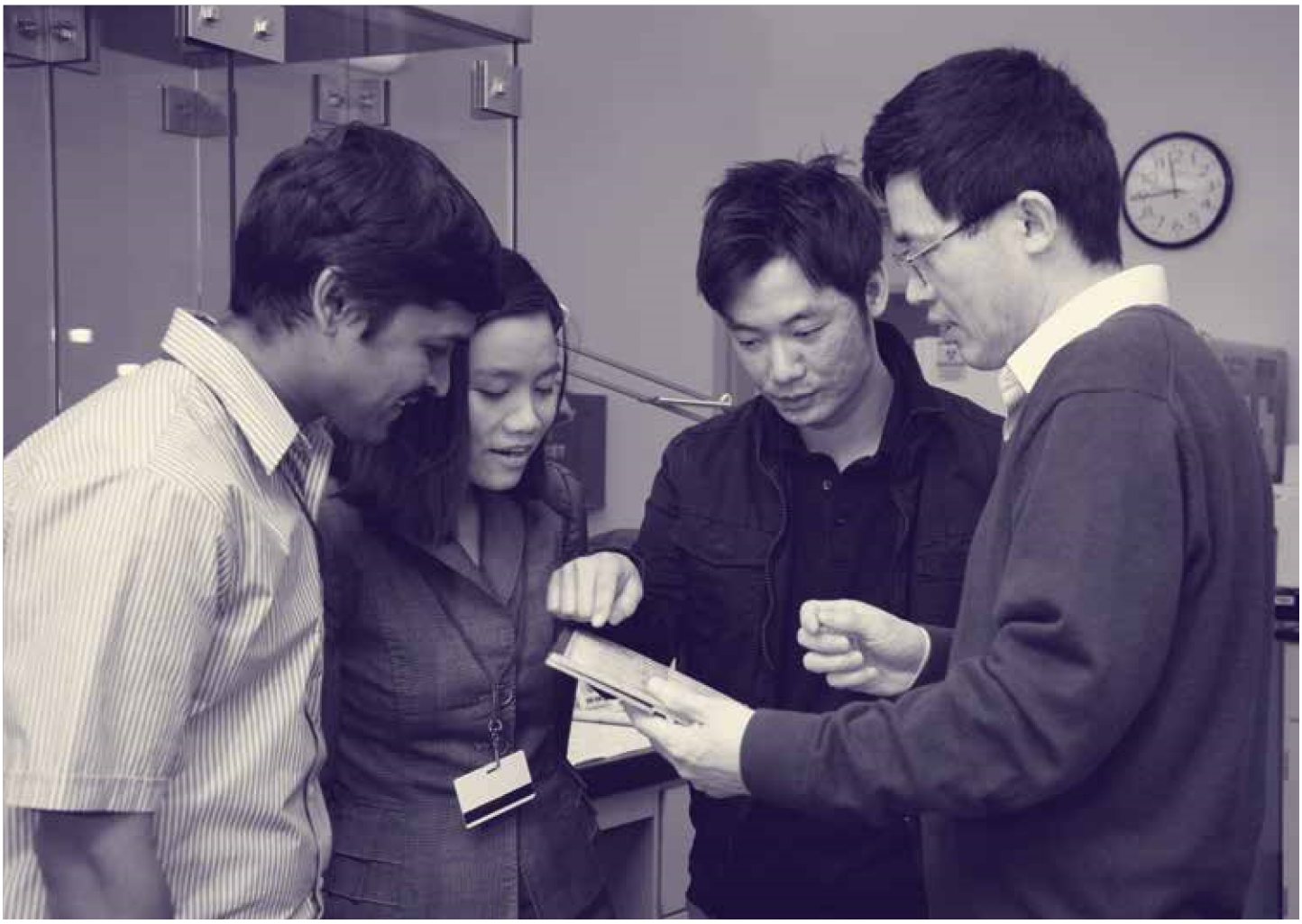


The Department of Comparative Biomedical Sciences at the LSU School of Veterinary Medicine

Graduate Program Guidelines

A Supplement to the LSU Graduate Catalog

Prepared by the CBS Graduate Student Affairs Committee 2024

TABLE OF CONTENTS

Appendices

1. GENERAL DESCRIPTION OF THE PROGRAM

The graduate program in Comparative Biomedical Sciences (CBS) offers an interdisciplinary approach to the study of the biomedical sciences as they apply to humans and animals. The goal of the program is to educate and prepare students for successful careers in academia, industry, government, or private non-profit environments. The degrees granted by the School of Veterinary Medicine (SVM) are Ph.D., M.S. degree or Graduate Certificate in Biomedical and Veterinary Sciences, with concentrations in Anatomy, Cancer Research, Cardiovascular Disease, Cell and Molecular Biology, Environmental Health Sciences, Neuroscience, Pharmacology, Physiology, and Toxicology. The research interests and directions of the CBS graduate faculty members are illustrated by the titles of the research projects currently supported through intra- and extramural funding and by recent publications. Faculty areas of research emphasis are listed on the Department website (lsu.edu/vetmed/cbs). Ph.D. and M.S. students can focus on any aspect of the emphasis areas. Graduate study programs will be tailored to satisfy the interests of individual students by providing guidance for formal instruction and experimental investigations pertinent to the student's chosen area of study, under the supervision and guidance of their Graduate Research Mentor and Graduate Advisory Committee. The Graduate Certificate Program targets students seeking to enhance their competitiveness for admission into the professional program in veterinary medicine or other medical professional programs; other targets are students considering graduate degree programs or further training for careers in the biomedical, animal, or public health fields.

2. REQUIREMENTS FOR ADMISSION

Ph.D. and M.S. Programs

- A baccalaureate degree from a college or university approved by a regional accrediting agency.
- An overall undergraduate grade point average of 3.00 on a 4.00-point scale (with a 3.00 for all math/science coursework) is required for unconditional admission; likewise, a 3.00-grade point average is required for any graduate coursework completed.
- Most successful applicants will have completed one year of each of the following: inorganic chemistry, organic chemistry, physics, and biological science. Also, introductory biochemistry and one year of calculus are strongly recommended.
- All international applicants must present a score of 79 or higher on the internet-based exam of the Test of English as a Foreign Language (TOEFL) or 550 or higher on the paper-based exam to be considered for unconditional admission.
- Letters of recommendation from three faculty members or other individuals familiar with the applicant's work.
- A personal statement from the applicant describing how their background prepares them for graduate study, and what are their research interests and career goals.
- An applicant interview with the Departmental Graduate Student Affairs Committee. In cases of well-qualified students from locations that are a great distance from Louisiana, the interview requirement may be conducted online.

3. ADMISSION PROCEDURE

Ph.D. and M.S. Programs

The application for admission to The Graduate School is accessed online at lsu.edu/graduateschool/admissions/apply.php.
Applicants who have questions concerning the application and review process should address inquiries to the Graduate Recruiters, Drs. Alexandra Noël or Ahmed Abdelmoneim, Department of Comparative Biomedical Sciences, LSU School of Veterinary Medicine, 1909 Skip Bertman Drive, Baton Rouge, LA. You may contact Dr. Noël by email anoel@lsu.edu, and Dr. Abdelmoneim by email aahmed10@lsu.edu.

4. STIPENDS AND FINANCIAL SUPPORT

Every effort will be made to provide financial support to Ph.D. students who are in good academic standing and who continue to make progress toward the degree. This support may be provided from one of several sources:

- Stipend from the School of Veterinary Medicine: These stipends are awarded upon Departmental recommendation.
- Graduate Assistantship Funded by the Department: These stipends are administered solely by the Department Head in consultation with the faculty.
- Research Grants of Individual Faculty Members: A student may be paid a stipend from research grants of their Graduate Research Mentor if the student contributes to the research effort.
- Individual Research Fellowships: Students with outstanding academic achievements are encouraged to apply to federal granting agencies, including the National Science Foundation and National Institute of Health, or private, nonprofit organizations, such as the American Heart Association, to obtain personal pre-doctoral fellowships. Students with the M.D., D.D.S., or D.V.M. degree will be encouraged to apply for an individual National Research Service Award (NRSA). Students desiring a Ph.D. degree who successfully compete for an NRSA are still considered graduate students and are subject to all the requirements for the doctoral degree.
- Teaching Assistantships: Teaching Assistantships for the Form & Function professional courses may be available depending on Department and school resources. Students are expected to remain in good academic standing and to complete the required teaching preparatory course(s) with a minimum “B” grade to receive a Teaching Assistantship.

The Department will make every effort to administer funds for stipends and financial assistance as fairly and equitably as possible; however, financial aid is rarely awarded to M.S. or Graduate Certificate students. Graduate students are not permitted to receive additional funds from university employment. Graduate students receive stipends and financial help to allow them to devote all their energy and time to their research and graduate training. Therefore, graduate students receiving stipends are prohibited from seeking outside jobs and/or part-time employment. Students who are in financial difficulty should discuss this matter with their Mentor, the Graduate Advisor, the Department Head, or the Associate Dean of Research and Graduate Studies. Students receiving financial support from the SVM, the School of Graduate Studies, the CBS department, or a research grant are expected to maintain a “B” average (good academic standing) on all coursework, to make constant progress toward their degree, and to follow the recommendations of their Graduate Advisory Committee and Mentor. Financial support may also be withdrawn from students who fail to meet these basic requirements. Applicants admitted on probation and students placed on probation may not be appointed to a graduate assistantship during their period of probation. Departmental evaluation of student progress and the awarding of stipends occur annually.

5. RESIDENCY PROGRAMS FOR VETERINARIANS

The Louisiana State University SVM offers residency programs for veterinarians in many areas. Some of these programs, such as Pathology and Laboratory Animal Medicine, normally require students to complete a graduate program. Acceptance into the residency programs is separate from acceptance into the graduate program, and potential residents must apply to and be accepted into a graduate program. Residents are encouraged to explore all the options available through the SVM before choosing their graduate program. Following arrival at LSU, students should meet with and discuss the graduate opportunities available with the Graduate Student Affairs Committee (GSAC), the Department Head, or the graduate faculty in CBS. The faculty recognizes that time demands on residents are different from time demands on full-time graduate students who do not carry clinical responsibilities and that the timeline should be adjusted accordingly. The Appendices C and D provide guidelines for students in combined Resident-MS and Resident-Ph.D. programs, respectively.

6. RESPONSIBILITIES OF THE GRADUATE PROGRAM PARTICIPANTS

Graduate education within the Department is guided by the Graduate School, the Departmental GSAC, the Department Head, and the Departmental graduate faculty. The principal responsibility for an individual graduate student's study plan and research rests with that student, guided by the student's Graduate Research Mentor (GRM; Mentor) and a responsible Graduate Advisory Committee (GAC; Committee). The role of each of these individuals and committees is defined below.

6.1. The Graduate Student Affairs Committee (GSAC)

The GSAC consists of members of the CBS graduate faculty who assist the Department Head in administering the CBS graduate program.

The Department Head appoints this committee from members of the CBS graduate faculty for a term of three years with the possibility of another three-year term. The GSAC oversees the Departmental graduate student admission process. The GSAC membership consists of at least a Graduate Advisor, a Graduate Recruiter(s), and an additional at-large member(s). The Graduate Advisor and the GSAC are responsible for upholding the guidelines outlined below and in the Graduate School catalog and ensuring uniformity of the graduate program and its standards.

The Graduate Recruiter(s), in conjunction with the members of the committee, acts as the contact for potential students. The GASC determines whether the applicant meets the minimum requirements for acceptance into the program. The GSAC reviews applicants' folders, presents a summary of the potential graduate candidates' folder evaluation to the CBS faculty, and recommends a ranking of candidates. The Department Head adds his/her comments to those of the GSAC and CBS graduate faculty. Then, the list of recommended candidates and ranking are submitted to the LSU SVM Graduate Academic Studies (GAS) Council and Associate Dean of Research and Graduate Studies. Based on information provided by the GSAC, the Graduate Advisor will inform students by letter of their acceptance into the department and of the awarding of stipends (if applicable).

- The Graduate Advisor will serve as a departmental representative to the SVM Graduate Academic Studies (GAS) Council
- Before selection of a mentor by the student, the Graduate Advisor will act as a pre-mentor, advising the student on course work and research opportunities in the Department.
- The Graduate Advisor is responsible for ensuring that all graduate student forms and records are completed and maintained.

The optimal time of completion for a Ph.D. and a M.S. students are five years and two years, respectively. The Graduate Advisor will keep CBS graduate students and their mentors aware of graduate school milestones and necessary paperwork, such as those defined in the Appendices, thus helping to facilitate the student's timely progression through the program. Also, annual reviews of the student's progress prepared by the Mentor using the CBS Student Evaluation Form (Appendix F), and filed with the GSAC. As the liaison with the Graduate School, the Graduate Advisor is responsible for the implementation of changes in the graduate program, as recommended by the Graduate School, or by the CBS Department Head, subject to approval by the CBS graduate faculty members (including associate members).

The GSAC serves as the first mediator in the resolution of disputes between students and faculty with regard to the CBS graduate program. If the GSAC is unable to mediate an accord, the parties may take their grievance through the LSU chain of responsibility: CBS Department Head, SVM Associate Dean of Research, and Dean of the Graduate School. Other duties of the GSAC include:

- Creating, implementing, and updating a plan of active recruitment of graduate students.
- Evaluating and making recommendations regarding the nomination of Departmental faculty for membership in the graduate faculty.
- Coordinating advertisement of the CBS Department through annual reports, flyers, and pamphlets, web-based opportunities to promote local, state, national, and international recognition of the Department and its faculty and graduates.

- Researching graduate stipends nationally to ensure that stipends offered by the CBS Department are competitive and equitable, and making this information available to faculty preparing proposals.

- Reviewing the CBS Graduate Guidelines annually to determine whether adjustments are necessary and, if so, to present these changes to the CBS graduate faculty and the CBS Department Head.

- Evaluating and making recommendations on the admission of students under special circumstances.

6.2. The Student

The student has the ultimate responsibility for the success of his/her graduate program. The student is responsible for initiating contacts to identify a Graduate Research Mentor and the members of the student's Graduate Advisory Committee whose academic interests and research programs coincide with the student's goals. The student is responsible for writing the proposed plan of study and conducting the research necessary to successfully complete the degree requirements. Continued updating of the Mentor and the Committee on the research progress is the responsibility of the student. A checklist of degree requirements that the student should follow is included in the Appendices. Time limits outlined by the LSU Graduate School must be followed.

6.3. The Graduate Research Mentor (GRM; Mentor)

It is expected that all students will have identified their Graduate Research Mentor after completion of their laboratory rotations, within one year of admission. The Graduate Research Mentor must be a member of the CBS graduate faculty. The Mentor is responsible for guiding the student through the graduate program. The Mentor advises the student on the membership of the student's Graduate Advisory Committee. The Mentor evaluates the student's research, chairs the student's graduate examinations, and acts as a liaison between the Graduate School and the student. It is the Mentor's responsibility, with the cooperation of the student and the Graduate Advisory Committee, to identify and help rectify any coursework deficiencies pertinent to the student's degree. The Mentor will organize a Graduate Advisory Committee meeting on an annual basis to discuss the student's progress. Following this meeting, the Mentor will prepare and submit a written report to the GSAC documenting the student's progress over the previous year and noting where any deficiencies or problems have been identified. This report should include an individual development plan for the following year. This report will become part of the student's file. The Mentor will provide a written report on the student's degree progress to the GSAC annually.

6.4. The Department Head

The Department Head, a full member of the graduate faculty, may serve as a Graduate Research Mentor and as a member of a Graduate Advisory Committee. The specific responsibilities of the Department Head regarding graduate studies are as follows:

- The Department Head will appoint the members of the GSAC from the CBS graduate faculty.

- Based on information provided by the GSAC, and with the approval of the Department Head, the Graduate Advisor will inform students by letter of their acceptance into the Department and of the awarding of stipends (if applicable).

- The Department Head will keep the GSAC current on the availability of stipends.

- The Department Head must approve the selection of the Mentor and membership of Graduate Advisory Committee.

- The Department Head must approve all requests for part-time status in the MS and Ph.D. programs.

- If the GSAC (as the first mediator in the resolution of disputes between students and faculty) is unable to mediate an accord, the parties may take their grievance to the CBS Department Head or the Associate Dean of Research and Graduate Studies.

6.5. The Graduate Advisory Committee (GAC; Committee)

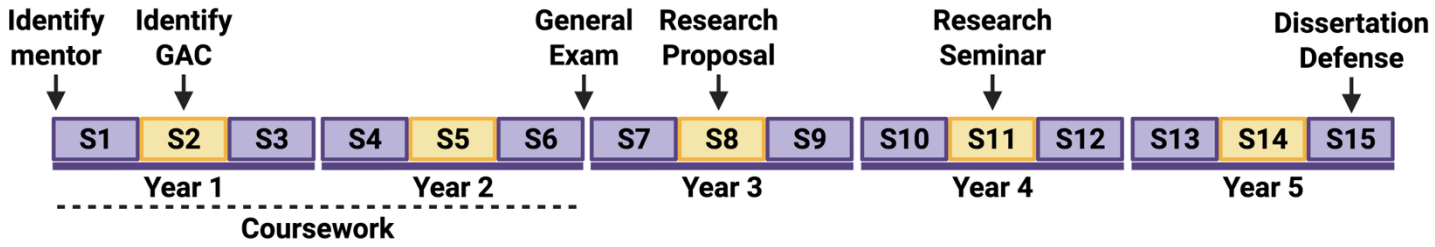
The Graduate Research Mentor and the Graduate Student, together, should propose the membership composition of the Graduate Advisory Committee, which must be approved by the Department Head and the Dean of the Graduate School. The Graduate Advisory Committee will consist of at least four (4) members including the Graduate Research Mentor, two of whom must be full members of the graduate faculty, and two of whom must be from CBS. At least one member must be from outside the CBS Department. Non-CBS members of a committee may be from any Department pertinent to the student's area of concentration. If the student and mentor feel that an individual from outside of LSU would be a valuable addition to a student's Committee, a formal Administrative Approval Request that justifies the selection of the non-LSU member must be made in advance. This official request must be signed by the CBS Department Head and the Dean of the SVM before it is transmitted to the Graduate School for final approval. A Dean's Representative will also be appointed to the Committee by the Graduate School as an additional member. The Dean's Representative is a graduate faculty member who will serve on the Committee for both the general and final exams.

7. REQUIREMENTS FOR THE DOCTOR OF PHILOSOPHY DEGREE

The Doctor of Philosophy degree is the highest academic degree offered by the University. It is conferred only for work of distinction in which the student displays original scholarship. The primary emphasis of the doctoral program will be to provide an environment for the student to learn how to think, how to answer research questions, how to write and communicate, and to develop into a competent biomedical scientist. The program of study includes the required Department courses, other coursework in the student's area of specialty, and completion of an original research project resulting in an acceptable dissertation. The dissertation must demonstrate a contribution to the student's major field of study and mastery of research techniques. The emphasis in the Ph.D. program is placed on original and creative research.
A major aim of this program is to enable the student to become a self-educating scholar and researcher.

7.1. Doctoral Timeline

The Graduate Research Mentor and the Graduate Student, together, should propose the membership composition of the Graduate Advisory



7.2. Outline of the Graduate Program

Each graduate student should receive exposure to the basic area of knowledge necessary for his/her future performance as a well-trained Doctor of Philosophy: adequate knowledge in biomedical sciences and in-depth knowledge in the selected areas of specialization. The academic coursework for each student will be developed in consultation with and approved by the Graduate Advisor or the student's Graduate Advisory Committee. Sixty hours of credit, beyond the baccalaureate or professional degree, at the graduate level (in courses numbered 4000 or above) must be earned.

To ensure a timely progression to graduation, a research proposal should be submitted to the student's Graduate Advisory Committee by the end of the second year. The research emphasis will be directed towards that encompassed by the expertise of the Graduate Research Mentor and members of the Committee. Students should provide an outline of the courses taken, grades received in these courses, and future courses, as described in the Appendices. The emphasis should be on generating a clear, concise document. This plan will be discussed, amended (if necessary), and approved by the Committee. It is recommended that full-time graduate students complete their study plan and research within five academic years. Students combining a Ph.D. in CBS with a D.V.M. residency program

should complete their study plan and research within five academic years. All students must complete their Ph.D. degree within seven years.

7.3. Coursework

Each student is expected to understand the concepts, experimental approaches, and recent advances in their area of research specialization. The academic coursework for each student will be developed in consultation with and approved by the GSAC. A minimum of sixty hours of credit, beyond the baccalaureate or professional degree, at the graduate level (in courses numbered 4000 or above) must be earned.

Students need a minimum of 27 credits from courses at or above the 7000-level. other than dissertation research (VMED 8900/9000), including:

- 4 credit hours of CBS 7104 Biomedical Cell and Molecular Biology (can take in the first fall semester)
- 2 credit hours of VMED 7004 Introduction to Research (can take in the first fall semester)
- 3 credit hours of CBS 7637 Biomedical Physiology 1 (can take in the first spring semester)
- at least 3 credit hours of experimental statistics at the 7000 level (e.g.: EXST 7003 (4) or PBS 7312 (4)) (can take in the first spring semester)
- 3 credit hours of CBS 7108 Critical Analysis in Molecular Biology/Medicine (should be taken in the second-year fall semester)
- Students are required to register and attend CBS 7005 (Seminar Series & Publications Study in Comparative Biomedical Sciences) in all spring and fall semesters unless there are schedule conflicts with other classes; students who receive a "U" grade will not be eligible to receive funding from the CBS department for conference travel. "Students can earn up to 6 credit hours out of this course."

The Graduate Advisory Committee can recommend that a graduate student take other courses at the 7000 (and approved 4000) level. Courses at the 4000 level must be approved by the LSU Graduate School as being acceptable for graduate credit. Elective courses must be approved by the GAC, as well. The courses available are listed in Chapter 10.

- If the student declares a minor, the student must fulfill the requirements as defined by the minor Department in addition to the CBS requirements.
- Laboratory rotations. During the first year of study, all graduate students supported by the school-based funding are required to perform three laboratory rotations, consisting of approximately eight (8) weeks each, with mutually agreed upon graduate faculty members. Each rotation is one credit (VMED8900).
- Minor in CBS. Students in other Departments who declare a minor in the Biomedical and Veterinary Medical Sciences CBS option will be required to take nine credits of CBS courses, 7001 or above.

7.3.2. Grading Policy

- In the School of Graduate Studies, Cumulative grade point average is the average based only on graduate work graded "A," "B," "C," "D," and "F" ("A" = 4, "B" = 3, "C" = 2, "D" = 1, "F" = 0). The letter grades "A", "B", "C", and "D" have the suffix plus (+) or minus (-) included to distinguish higher and lower performances within each of these letter grades, which add or subtract 0.3 points to the letter grade. The letter grade F does not include the plus/minus distinction.
- No letter grade will be given for research or seminar courses but will be allowed for special topics or methods courses. For research or seminar courses, "satisfactory" will be indicated by "S" and "unsatisfactory" by "U."

- An "I" grade indicates that course performance was satisfactory, but because of circumstances beyond the student's control, all requirements were not met. Authorization from the Dean of the Graduate School is not required to assign an "I" grade to a graduate student.

- A "W" grade indicates that a course has been dropped between the dates specified on the academic calendar. In extraordinary cases, the Dean of the Graduate School may authorize a resignation and/or course drop after the last date specified.

7.3.2. Good Academic Standing and Probation

Graduate students are considered to be in good academic standing, (making satisfactory academic progress), if they maintain a 3.00 cumulative grade point average on all graduate course work and a 3.00 semester average on all course work, and earn a grade of "S" in research A student whose cumulative grade point average is below 3.00 will be placed on academic probation. A graduate student on academic probation must maintain a grade point average of 3.00 or higher for each term on probation with no course grades of "C" or below. If the student scores below a 3.00 average for any semester while on probation, that student may be dropped from the program. Probationary status is removed when the student raises his or her cumulative grade point average to 3.0 or better. Applicants admitted on probation and students placed on probation may not be appointed to a graduate assistantship.

7.3.3 Transfer of Graduate Credit

Upon request, a student may transfer credit hours towards some of the required courses, as described in the Graduate School catalog. This transfer of credit would need the approval of the departmental GSAC, the Department Head, and the Dean of the Graduate School.

7.4. Research

The research component of the doctoral program consists of original research, presentations at Departmental seminars and scientific meetings, publication of papers, and preparation and defense of a dissertation. Students are expected to conduct laboratory and library research even when courses are in progress because learning how to apportion their effort is a key element of the training. The emphasis will be on research, however, and the time available for research will increase each year. *The balance of time will be imperative for those with a teaching assistantship, as they will be expected to maintain research productivity in addition to their coursework and teaching responsibilities.*

7.5. Laboratory Rotations

During the first year, the new graduate student will take a minimum of three research rotation courses (VMED 8900). Based on the list of faculty members who are, at that time, available to accept students with stipends from the School of Veterinary Medicine in their laboratory, each student must provide the Graduate Advisor with a list of faculty members with whom he or she would like to conduct research rotations, for consideration by the GSAC. If a laboratory already has a graduate student on a School of Veterinary Medicine stipend, this laboratory cannot be on the list. Each of these research rotations should last approximately eight (8) weeks. They provide first-hand knowledge of specific faculty research in areas such as cell biology, cardiovascular disease, environmental toxicology, cancer biology, and neuroscience, and they serve as a basis for choosing a Graduate Research Mentor. At the end of each rotation, the student should expect to prepare a brief report summarizing experiments and results. Each faculty rotation mentor will also prepare a short report for the GSAC about the student's progress during the rotation.

7.6. Selection of a Graduate Research Mentor

By the end of the spring semester of the first academic year, based on their research rotations, each student should choose a Graduate Research Mentor with whom to conduct dissertation research. The selection is made by listing a first choice and an alternate selection in a letter to the Department Head and the GSAC. Every effort is then made to place the student in the laboratory of his/her first choice, provided that the faculty member is agreeable, and that space and funds are available to support student research.

7.7. Selection of a Graduate Advisory Committee

A Graduate Advisory Committee should be established soon after the selection of the Graduate Research Mentor. The Mentor will request approval of the Committee membership from the Department Head and the GSAC in writing. The members of the Committee should be graduate faculty members who have research expertise, especially in areas related to the student's interests. The Committee provides advice and support on the student's research, monitors the development of the student into a productive and competent investigator, and evaluates the student's progress. The committee meets at least annually to conduct formal evaluations, and it conducts the General Exam and Final Examination.

7.8. Study Plan and Research

Each Ph.D. student should receive exposure to the basic area of knowledge necessary for his/her future performance as a well-trained Doctor of Philosophy: adequate knowledge in biomedical sciences and in-depth knowledge in the selected areas of specialization. The research emphasis will be directed towards that encompassed by the expertise of the Graduate Research Mentor and members of the Graduate Advisory Committee. To ensure a timely progression to graduation, a study plan and research outline should be submitted to the student's Committee by the end of the second year. Students must provide an outline of the courses taken, grades received in these courses, future courses, and a short research outline. This plan will be discussed, amended (if necessary), and approved by the student's Committee.

7.9. Leave Policy

Graduate students are allowed two (2) weeks (10 working days) of vacation during the academic year, including the summer session. Each student must seek permission from their Graduate Research Mentor at least one (1) week before leaving on vacation, and they must sign out in the CBS office with a beginning and ending date of leave. Additional leave time may be granted for unusual circumstances; however, the leave must be approved by the Mentor and the GSAC at least two (2) weeks before the requested leave. Students who take a vacation or extra leave without permission will be subject to loss of stipend or expulsion from the program.

7.10. Time Requirement for Constituting a Dissertation Committee

The Graduate Affairs Committee shall constitute the ad-hoc dissertation committee for all new graduate students hired through school funds. The committee will provide assessments of these students until they commit to a lab not later than the second semester (spring).

For direct recruit students, individual graduate research mentors will be responsible for setting up a dissertation committee by the end of the second semester. For students who resume in the fall, committee formation should be concluded by the end of the following spring. Similarly, for students who resume in the spring, committee formation should be concluded by the end of the following fall.

Dissertation Committee Assessment

This is held 2-3 times a year. At least 2 out of 3 semesters each year. The summary of the committee assessment (Appendix G) should be signed and returned to the CBS departmental office.

The assessment form must be signed by the graduate research mentor, all participating committee members, and the departmental graduate advisor. The dean's representative is not required to attend the progress meetings. However, the Dean's representative must be present for the general exams, progress presentations, and dissertation defense.

7.11. Qualifying Process and General Examination

The qualifying process for students in the CBS Department consists of the successful completion of the core curriculum with a General Examination. Students become eligible to take the general examination after demonstrating adequate academic and professional aptitude to the Graduate Advisory Committee. The General Examination should be scheduled soon after completion of coursework, preferably after the spring semester of the student's second academic year, but must be passed by the end of the third academic year. Passage of the general examination demonstrates that the student has acquired a broad-based scientific knowledge, a detailed

understanding of their area of expertise, and can formulate a hypothesis and design an experimental approach to address the problem. The General Examination is intended to ensure that the doctoral student who has successfully completed coursework requirements can identify specific questions that remain unanswered in a research area of biomedical sciences and develop a written research proposal that describes experimental approaches to answer these questions.

The General Examination consists of a comprehensive written exam that is designed to test knowledge, comprehension, and analytical ability. Each member of the Graduate Advisory Committee will submit a broad-based question, which may be multifaceted. The exam format is "take-home" – open books, notes, and internet resources. The student should prepare for the Exam by asking individual members of the Committee to suggest reading material and resources that should be mastered. In turn, each Committee member will provide the student with a written question, which will be completed by the following day. Upon completion of each day, the student will submit the answer to the exam question to the Mentor for grading by the Committee. The students will receive written questions from each committee member sequentially. The Dean's Representative has the option of providing a written question to the student, but is not required to do so. Students are expected to synthesize information from the literature concerning the questions offered. No more than two weeks after the student submits the written component of the General Exam, the student and the Committee should convene a meeting to administer the oral component. This will consist of sequential questioning by the Committee members. The oral part of the General Exam is open only to the members of the Committee. The oral examination will not be limited to the written questions; rather, this component will serve as a basis from which the student's knowledge of their completed curriculum will be examined. The outcome of the General Examination is assessed according to the graduate school guidelines (catalog.lsu.edu/content.php?catoid=27&navoid=2434#general-examination).

- If the Committee votes that the student has passed the General Examination, then the student should immediately begin to address the requirement of the doctoral Research Proposal.

7.12. Research Proposal

The student must submit a written research proposal as soon as possible (i.e., 1 - 2 months) after completing the General Examination and becoming a Candidate for the Doctoral degree.

An important component of a training program is to teach students about the real world of a professional research career. Integral to this is the preparation, presentation, and peer review of a Research Proposal describing the student's research project. Preparation of the proposal allows the student to become aware of the findings of other researchers in his/her field, to learn how to prepare a research grant, to focus on his/her major research aims and the rationale and methods to achieve these goals, as well as to introduce the student to the peer review process.

This proposal is written in an NIH R21 Grant Application format by the student (including a one-page Specific Aims, a six-page Research Strategy, and a References section) to be used to answer the research questions being asked. The purpose of the research proposal is for the student to define his/her doctoral research project, which will be the subject of the doctoral dissertation. The choice of the topic should result from experiments conducted by the student during his/her first two years and from discussions with the student's Mentor and Graduate Advisory Committee.

Since this proposal represents a research plan for the student's dissertation research project, the major role of the student's Committee is to offer suggestions and comments on the proposed research, to ensure the propriety of the project, and to make certain that the student is prepared to undertake the doctoral research. The student will present the proposal at a public seminar, open to questions from the audience. Immediately after the seminar, the student will meet separately with his/her Committee to review and discuss the proposal. The Committee may decide:

- to approve the proposal as written, or

- to require modification(s) of the proposal in a manner acceptable to the committee.

If significant changes are required, the Committee may elect to have the proposal rewritten and returned to the Committee for approval. The proposal will be approved as written (and modified) if there is no more than one negative vote. Approval of the research

proposal by the Committee assures the student that the Committee feels that satisfactory completion of the proposed research by the student should constitute an acceptable doctoral dissertation. The student is then expected to devote a major portion of his/her time to the research project. The progress of his/her research is monitored by the Mentor and by at least annual meetings of the Committee, and documented by the Mentor with a written report.

7.13. Seminars

A seminar is the one occasion at which all faculty, post-doctoral researchers, and graduate students meet regularly and discuss research findings and new developments in the disciplines of biomedical sciences. It is a unique opportunity for a graduate student to demonstrate his/her abilities as a teacher and biomedical scientist, to learn how to present and discuss experimental data, and to think on his/her feet. A seminar program in which all researchers within the department participate fosters unity and mutual respect among the participants and provides an atmosphere that promotes research and collaborative investigations. Attendance at scheduled CBS seminars/weekly CBS/PBS seminars and seminars given by visitors to the Department is mandatory. Every student is expected to attend every seminar, and students are expected to participate actively in a seminar by contributing to the discussion. The required seminars include:

- A seminar presenting the proposed dissertation research project.
- A research seminar on work in progress. This seminar should be presented at least one year before the expected date of graduation. It could be presented at the combined CBS/PBS seminar series or the Breakfast and Science seminar series.
- The Dissertation Defense seminar.
- Each graduate student in the CBS program is also expected to make an informal presentation of recent results at the yearly CBS Departmental retreat.

A typical Journal Club seminar will be a presentation of research data from a carefully selected paper and should be presented in a critical and informative manner, such that the audience can appreciate the state of the art of the research. The student is expected to read a considerable body of literature so that he/she has a good understanding of the field, techniques, and experimental approaches being used to address the fundamental questions. The seminar, however, is not a lecture or an overview. It is a highly focused presentation of experimental design and results to further our knowledge about a specific question. During the seminar, the student is expected to discuss the limitations, strong points, and problems of interpretation of the data.

A typical research seminar will start with an introduction to state the questions being asked and to provide background information for the audience. The body of the seminar concerns the experimental rationale and methodology being employed to answer the questions, followed by the data presentation. The summary should contain the conclusions reached by the student from the presented data, as well as a discussion of further studies to be conducted. It is expected that the student has practiced his/her seminar presentation and has prepared audiovisual aids to enhance the exchange of information. The student is encouraged to practice the seminar with advanced students/postdoctoral fellows and/or Mentors.

In addition to requirements concerning research, coursework, and seminars, every graduate student is expected to participate in other scholarly activities. These activities vary among individuals, but students are expected to participate in journal clubs, to keep abreast of major developments in their field and in related biomedical sciences, to present their research findings at meetings of professional societies in their field, by assisting other students and staff in research techniques and in the use and maintenance of instrumentation, to help in the recruitment of graduate students into the program, and to take an active role in maintaining the research environment of the department and university. All students are required to participate in the CBS Journal Club (CBS 7004) and Seminar (CBS 7001) each semester during which they are registered. Attendance is mandatory, and any absence must have prior approval from the instructor. Mentors may also require student participation in other departmental or non-departmental

journal clubs. It is expected that every Doctoral Candidate will publish at least one first-author paper on the findings from his/her dissertation research in a national/ international journal. All students are expected to attend all guest seminars and guest lectures in graduate courses by visiting faculty.

A day-long Graduate Student Retreat will be an annual event that will focus on graduate student and postdoctoral presentations of proposed research, and progress reports of their thesis and dissertation research. Invited speaker(s) on topics related to graduate student issues (e.g., career opportunities, job search skills) may also be included. Graduate students are expected to participate in this event. The retreat will be organized by the GSAC and will be open to all faculty, staff, and graduate students. This event will be scheduled annually.

7.15. Teaching

Currently, there are no teaching requirements for obtaining a degree in CBS. However, there may be teaching assistantships available for the professional Form & Function courses. These assistantships require anatomy teaching experience and/or specialized courses and training to be able to teach. If you are interested in this option, please discuss the feasibility of adding teaching duties to your professional development program with your mentor and the Graduate Advisor.

7.16. Appropriate Student Conduct and Dress

All students will maintain a high degree of ethical standards in their personal conduct toward faculty, staff, and fellow students at LSU. All research data will be maintained in a dated hard copy or electronic notebook with a full explanation of the methods and procedures used. Notebooks should be available for inspection at any time by their Mentor or
Graduate Advisory Committee members. Appropriate dress (lab coat and leather shoes with closed toes, gloves, and mask, depending on safety standards) should be worn in the laboratory. No eating or drinking is allowed in research labs at any time. Students should be familiar with and follow all safety regulations of the working environment.

7.17. Preparation and Defense of the Doctoral Dissertation

Dissertation research must be a contribution to the field, generating original findings addressing a fundamental question. It is expected that the primary substance of the study will be published in a journal of international repute and that the student will present his/her research findings at regional, national, or international meetings.

The dissertation is prepared by the student with guidance and advice from his/her committee. Upon completion of writing the dissertation, the student should provide copies of the dissertation to all members of his/her Advisory Committee. A clear, well-written dissertation based on the student's original research is part of the requirement for a Ph.D. The dissertation must demonstrate a contribution to the student's major field of study and a mastery of research techniques. The format of the dissertation must be in accordance with the instructions available on the LSU website lsu.edu/graduateschool/current_students/theses_and_dissertations/index.php

Once the dissertation research is complete, the student should start preparing a dissertation. Upon approval by the student's Committee, an application for scheduling the Dissertation Defense and Final Examination will be made following the deadlines listed on the graduate school calendar.

Before the Final Examination, the student is required to present a final research seminar open to all faculty, students, and staff of the institution. In this seminar, the student will present an overall view of his/her doctoral research. The Dissertation Defense and Final Examination will focus on the dissertation research and the dissertation itself. The student is expected to answer questions about the work, defend the validity of the conclusions, and discuss suggestions for revisions to improve clarity.

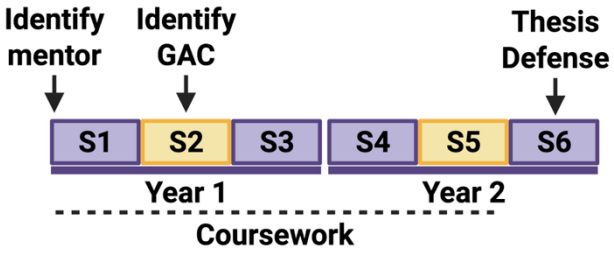
The final examination and dissertation defense examine the procedure, content, and student's understanding of the work presented in the dissertation. This examination may extend into subject matter related to or distant from the dissertation. The final examination must be advertised to the University community. The formal presentation and question session are open; however, the oral exam

following the end of the open examination is only open to the Committee and graduate faculty. The Committee will meet in a closed session to discuss and evaluate the disposition of the degree. The outcome of the Final Examination is assessed according to the graduate school guidelines (catalog.lsu.edu/content. php?catoid=27&navoid=2434#final-examination). Failure of the final examination requires more than one dissenting vote.

8. REQUIREMENTS FOR THE MASTER OF SCIENCE DEGREE

The M.S. program in CBS is designed to further develop the scientific knowledge and problem-solving abilities of the student. In this degree program, students expand their knowledge of the Department's emphasis areas and related sciences through advanced courses and seminars while learning to apply the scientific method to the study of a specific research problem.

8.1. Master of Science Timeline



8.2. Outline of the Graduate Program

The M.S. study plan involves coursework in the student's area of specialty and the completion of an original research project resulting in an acceptable thesis. The study plan and research proposal should be submitted to the student's Graduate Advisory Committee by the end of the second semester. The plan consists of courses taken, grades received in these courses, courses planned to finish the degree program, and a brief research proposal as outlined in the Appendices. The emphasis should be on a clear, concise document. This plan will be discussed, amended (if necessary), and approved by the Committee. Full-time M.S. students should complete their study plan and research within two academic years with an accumulation of 30 semester credit hours (see recommended timetable, Appendices). Students combining an M.S. in CBS with a D.V.M. residency program should complete their study plan and research within three academic years (see recommended timetable, Appendices). All students must complete their M.S. degree within five years.

8.3. Coursework

Minimal course loads are determined by the student with the approval of the Graduate Advisory Committee and to meet Graduate School requirements, but must include:

- A minimum of 30 hours of credit beyond the baccalaureate or professional degree in courses numbered 4000
- A minimum of 6 hours must be in Thesis Research (VMED 8000)
- A minimum of 24 hours must be in coursework other than Thesis Research (VMED 8000)
- At least half of the credit hours required must be earned through instructional hours and must be at the 7000 level (thesis hours excepted)
- 4 credit hours of CBS 7104 Biomedical Cell and Molecular Biology (can take in the first fall semester)
- 2 credit hours of VMED 7004 Introduction to Research (can take in the first fall semester)

- at least 3 credit hours of experimental statistics at the 7000 level (e.g.: EXST 7003 (4) or PBS 7312 (4)) (can take in the first spring semester)
- 3 credit hours of CBS 7108 Critical Analysis in Molecular Biology/Medicine (should be taken in the second-year fall semester)
- at least 3 credit hours of experimental statistics at the 7000 level
- A limit of 6 hours of Research Techniques (7002) (any Department) and 8 hours of Special Topics (7003) (any Department) may be used toward any graduate degree.
- Students are required to register and attend CBS 7005 (Seminar Series & Publications Study in Comparative Biomedical Sciences) in all spring and fall semesters unless there are schedule conflicts with other classes; students who receive a "U" grade will not be eligible to receive funding from the CBS department for conference travel. Students can earn up to 6 credit hours out of this course."

8.3.1. Grading Policy

- n the School of Graduate Studies, Cumulative grade point average is the average based only on graduate work graded "A," "B," "C," "D," and "F" ("A" = 4, "B" = 3, "C" = 2, "D" = 1, "F" = 0). The letter grades "A", "B", "C", and "D" have the suffix plus (+) or minus (-) included to distinguish higher and lower performances within each of these letter grades, which add or subtract 0.3 points to the letter grade. The letter grade F does not include the plus/minus distinction.
- No letter grade will be given for research or seminar courses but will be allowed for special topics or methods courses. For research or seminar courses, "satisfactory" will be indicated by "S" and "unsatisfactory" by "U."
- An "I" grade indicates that course performance was satisfactory, but because of circumstances beyond the student's control, all requirements were not met. Authorization from the Dean of the Graduate School is not required to assign an "I" grade to a graduate student.
- A "W" grade indicates that a course has been dropped between the dates specified on the academic calendar. In extraordinary cases, the Dean of the Graduate School may authorize a resignation and/or course drop after the last date specified.

8.3.2. Good Academic Standing and Probation

Graduate students are considered to be in good academic standing, (making satisfactory academic progress), if they maintain a 3.00 cumulative grade point average on all graduate coursework and a 3.00 semester average on all coursework, and earn a grade of "S" in research. A student whose cumulative grade point average is below 3.00 will be placed on academic probation. A graduate student on academic probation must maintain a grade point average of 3.00 or higher for each term on probation with no course grades of "C" or below. If the student scores below a 3.00 average for any semester while on probation, that student may be dropped from the program. Probationary status is removed when the student raises his or her cumulative grade point average to 3.0 or better. Applicants admitted on probation and students placed on probation may not be appointed to a graduate assistantship.

8.3.3. Transfer of Graduate Credit

Upon request, a student may transfer a maximum of 12 hours of credit toward some of the required courses. This transfer of credit would need the approval of the departmental GSAC, the Department Head, and the Dean of the Graduate School.

8.4. Selection of a Graduate Research Mentor

M.S, students are admitted after they have chosen a Graduate Research Mentor, with whom to conduct thesis research. The selection is made by listing a first choice and an alternate choice in a letter to the Department Head and the GSAC. Every effort is then made to

place the student in the laboratory of his/her first choice, provided that the faculty member has agreed, and that space and funds are available to support student research.

8.5. Selection of a Graduate Advisory Committee

A Graduate Advisory Committee should be established soon after admission to the program. The Mentor will request approval of the Committee membership (a total of three including the Mentor) from the Department Head and the GSAC in writing. The members of the Committee should be graduate faculty members who have expertise in research, especially in the areas related to the student's interests. The Committee provides advice and support on the student's research, monitors the development of the student into a productive and competent investigator, and evaluates the student's progress. The Committee meets at least annually to conduct formal evaluations, and it conducts the Defense of the Master's Thesis.

8.6. Selection of a Graduate Advisory Committee

The M.S. study plan involves coursework in the student's area of specialty and the completion of an original research project resulting in an acceptable thesis. The study plan and research proposal should be submitted to the student's Graduate Advisory Committee by the end of the second semester. The plan consists of courses taken, grades received in these courses, courses planned to finish the degree program, and a brief research proposal as outlined in the Appendices. The emphasis should be on a clear, concise document. This plan will be discussed, amended (if necessary), and approved by the Committee.

8.7. Research

All M.S. Degree students must write a thesis based on original scientific research under one of the approved departmental faculty members. Their Graduate Research Mentor and Graduate Advisory Committee must deem their research as publishable in scientific literature. In general, this research does not have the complexity required for the Ph.D. degree; however, it may subsequently be used as preparation for the Ph.D. dissertation. After admission, he or she can enroll in VMED 8000 (Thesis Research). The student should work closely with his or her Mentor to identify a thesis project and to select a committee. The Committee must meet at least once before the final defense of the thesis and must approve the progress of the student's research project for continuation in the program.

8.8. Seminars

All candidates for the M.S. degree must make at least one oral presentation of the results of the student's research upon completion of the program, at the defense of the Master's Thesis.

8.9. Scholarly Activities

In addition to requirements concerning research, coursework, and a seminar, every graduate student is expected to participate in other scholarly activities. These activities vary among individuals, but students are expected to participate in journal clubs, to keep abreast of major developments in their field and in related biomedical sciences, to present their research findings at meetings of professional societies in their field, by assisting other students and staff in research techniques and in the use and maintenance of instrumentation, to help in the recruitment of graduate students into the program, and to take an active role in maintaining the research environment of the department and university. All students are required to participate in the CBS Journal Club (CBS 7004) and Seminar (CBS 7001) series each semester. Attendance is mandatory, and any absence must have prior approval by the instructor. Graduate Research Mentors may also require student participation in other departmental or non-departmental journal clubs. All students are expected to attend all guest seminars and guest lectures in graduate courses by visiting faculty.

8.10. Preparation and Defense of the Master's Thesis

Upon completion of thesis research, the student will submit the completed thesis to his/her committee two (2) weeks before the scheduled date of the final seminar and defense of the thesis. Following the presentation of data in a seminar to the department, the candidate will undergo an oral defense to the Graduate Advisory Committee. The

Committee will assess the student's knowledge of the general area of the thesis and courses that pertain to the research. After the student has answered all questions about the thesis, the committee will discuss the thesis and revisions that may be necessary and vote on whether the student has passed. The outcome of the Final defense is assessed according to the graduate school guidelines (https://catalog.lsu.edu/content.php?catoid=27&navoid=2434#comprehensive-final-examination). Voting to accept the thesis (with all recommended revisions) will be by ballot, with no more than one negative vote permitted. When the student has passed the defense of the thesis, he/she will be certified to the Graduate Faculty and Dean for Graduate Studies as having met all requirements for the degree of Master of Science in Biomedical and Veterinary Medical Sciences.

The M.S. student will submit to his/her Committee a well-written, technical thesis based upon original research. The form of the thesis must be in accordance with the instructions available on the LSU website (lsu.edu/graduateschool/current_students/theses_and_dissertations/index.php)

8.11. Recommendation for Direct Ph.D Study Plan and Research

A student enrolled in the M.S. program may request that the M.S. degree be bypassed and that the student be allowed to pursue a Ph.D. program. The Graduate Advisory Committee will evaluate the performance and progress of the student to determine whether the request is justified by the student's performance. If so, the student's Mentor should inform the GSAC and the CBS Department Head in writing. This privilege cannot be extended to a student without successful completion of two semesters in the graduate program.

9. DESCRIPTION OF COURSES

Courses offered at LSU can be found at https://courseofferings.lsu.edu/.

The following are some of the CBS courses (Please check https://courseofferings.lsu.edu/ for current offerings)

7002 Research Techniques in Comparative Biomedical Sciences (1-4) F, S, Su. May be taken for a maximum. of 8 hours of credit when topics vary. Specialized research techniques related to selected scientific disciplines in the department.

7003 Special Topics in Comparative Biomedical Sciences (1-4) F, S, Su. May be taken for a maximum. of 8 hours of credit when topics vary. Specialized coverage of a variety of topics related to selected scientific disciplines in the department. (i.e., Immunotoxicology, Inhalation Toxicology. Taught on an as-needed basis)

7005 Seminar Series & Publications Study in Comparative Biomedical Sciences (1) F, S. Shaomian Yao. Prerequisite: permission of the department. May be taken for a maximum of 6 hours of credit. Review of the literature in areas of comparative biomedical sciences presented in a discussion format.

7104 Biomedical Cell and Molecular Biology (4) F. Masami Yoshimura. Prerequisite: consent of the course coordinator. Essential concepts of cell and molecular biology; cellular ultrastructure and function; basic genetic mechanisms in normal and transformed cells; methods of gene analysis; proteomics; molecular therapy and molecular approaches to disease diagnosis.

7106 Biomedical Electron Microscopy (4) F, S. Prerequisite: consent of the instructor. 1 hr. lecture; 8 hours lab. Preparation of tissues, including biopsies for transmission and scanning electron microscopy; operation of SEMs, TEMs, and ancillary equipment.

7108 Critical Analysis in Molecular Biology/Medicine (3) F. Masami Yoshimura. Prerequisite: consent of the instructor. Formal presentations of research data. Discussion and presentations are drawn from landmark biomedical publications.

7109 Advanced Macroscopic Anatomy (1-3) V. Michelle L. Osborn. Prerequisite: consent of the instructor. May be repeated for credit when topics vary. Specialized dissection of one or more of the following: dog, horse, ruminants, laboratory, exotic, or avian species.

7112 Advanced Microscopic Anatomy (1-3) V. Hermann H. Bragulla. Prerequisite: consent of the instructor. May be repeated for credit when topics vary. Comparative or systemic microscopic anatomy of selected organs or organ systems of domestic, laboratory, or exotic species.

7200 Basic and Applied Anatomy 1 (4) F. Michelle L. Osborn. Permission of department. Principles of macroscopic anatomy, basic structure, and applied anatomy of the bones, muscles, and joints of the thoracic limb, pelvic limb, and trunk; dissection of the dog, with relevant comparisons to the horse and domestic ruminants.

7201 Basic and Applied Anatomy 2 (3.5) F. Brooke Dubansky. Permission of department. Introduction to the nervous system; anatomy of the blood vessels and nerves of the thoracic and pelvic limb, the equine digit; comparative anatomy of the head, including the skull and mandible, nasal cavity and paranasal sinuses, ear, oral cavity, teeth, larynx, cranial nerves, surface of the brain and its coverings, and blood supply.

7202 Basic and Applied Anatomy 3 (4) S. Jeremy Delcambre. Permission of department. Anatomy of the neck and trunk, thoracic and pleural cavities, thoracic viscera; introduction to the autonomic nervous system; the abdominal wall, abdominal viscera, pelvic cavity, and viscera of the urinary and reproductive systems of domestic animals.

7205 Cell Biology (2) F. Shisheng Li. The molecular and cellular basis of animal health and diseases, and how the structure and functions of cells may be inherently related to those of tissues and organs.

7206 Microscopic Anatomy (4) F. Hermann H. Bragulla. The histology of the basic tissues of the body and the microscopic anatomy of the organ systems in domestic mammals, with consideration of the organ-specific microscopic structures covering the respiratory and urogenital organs, digestive system, defense and sensory organs, and skin.

7207 Developmental Morphology (1) S. Hermann H. Bragulla. The pre- and postnatal development of tissues, primitive transient and permanent structures, and the organ systems in domestic mammals (primarily cat, dog, horse, and domestic ruminants) starting at fertilization, including applied developmental knowledge of problems the mother and newborn might encounter after birth.

7208 Responsible Conduct of Research (1) F. Tammy Dugas & Arthur Penn. Permission of the Instructor. Instruction in Responsible Conduct of Research (RCR) that focuses on research misconduct.

7209 Discussions in Air Pollution (1) F, S. Tammy Dugas. Review of recent advances in the scientific literature in air pollution research, with special emphasis on particulate matter, environmentally persistent free radicals (DFPRs), and other forms of air pollution. Students will be expected to make presentations of current literature related to the field of study.

7210 Inhalation Toxicology (1) S. Alexandra Noël. Permission of the instructor. The students will learn about the major lung diseases caused by inhaled environmental pollutants and their physico-chemical properties, allowing for a better understanding of the current methods in inhalation toxicology, including study design and inhalation toxicity assessment. Students will be expected to participate in group activities during class and to take the written exams.

7603 Clinical Toxicology (3) F. Ahmed Abdelmoneim. Prerequisite: CBS 7630 and the consent of the instructor. Pathophysiology of various clinically important toxicants; prevention, diagnosis, and treatment of common intoxications in domestic animals.

7614 Central Nervous System (3) V Prerequisite: CBS 7631 or equivalent. Neurotransmitter mechanisms, chemistry, and anatomical distribution; neuropharmacology; synaptic physiology and anatomy of selected brain regions; central nervous system diseases.

7615 Pulmonary (3) V Prerequisite: CBS 7630. Mechanisms of action and applications of various drugs used in respiratory disorders.

7617 Autonomic Nervous System (3) Prerequisite: CBS 7631 or equivalent. Structure, physiology, pharmacology, and diseases of the autonomic nervous system.

7630 Biomedical Pharmacology (4) F. Levent Dirikolu. Prerequisite: vertebrate physiology, biochemistry, or equivalent; consent of instructor. 4 hours of lecture. Comparative study of the pharmacodynamics, disposition, kinetics, and therapeutic utility of drugs in animals.

7631 Biomedical Neuroscience (3) S. Charles Lee. Prerequisite: consent of the instructor. 1 hour lecture; 2 hours lab. Physiological and anatomical mechanisms underlying the nervous system.

7637 Biomedical Physiology 1 (3) S. Jiming Feng. Prerequisite: consent of the instructor. System-based physiology course of Skeletal Muscle Physiology.

7638 Biomedical Physiology 2 (3) F. Shaomian Yao. Prerequisite: consent of the instructor. System-based physiology course of Endocrinology, GI Physiology, Cardiovascular Physiology, and Respiratory Physiology.

F-Fall; S-Spring; Su-Summer; V-Varies

COURSES AVAILABLE IN OTHER DEPARTMENTS can be searched at https://courseofferings.lsu.edu/ using department codes (e.g., ANTH, BE, BIOL, ENVS, KIN, PBS, VCS, etc.).

ANTH 4010 Human Osteology (3)

ANTH 4040 Physical Anthropology (3)

ANTH 2014 Introduction to Forensic Anthropology (discussion to be developed into the graduate course)

(3)

BE 4337 Regenerative Medicine (3)

BIOL 3152/7152 Advanced Comparative Anatomy (4)

BIOL 3156/7156 Developmental Zoology (4)

BIOL 4087 Basic Biochemistry (4)

BIOL 4093 General Biochemistry I (3)

BIOL 4094 General Biochemistry II (3)

BIOL 4097 Biochemistry of Aging (3)

BIOL 4110 Introductory Microbial Physiology (3)

BIOL 4141 Mammalogy (4)

BIOL 4142 Ornithology (4)

BIOL 4145 Ichthyology (4)

BIOL 4146 Herpetology (4)

BIOL 4170 Comparative Animal Physiology (3)

BIOL 4160 Vertebrate Physiology (3)

BIOL 4161 Vertebrate Phyl Lab (1)

BIOL 4177 Neurobiology (3)

BIOL 4400 Molecular Genetics Laboratory (3)

BIOL 4596 Biophysics of Macromolecules (3)

BIOL 4800 Introductory Bioinformatics (3)

BIOL 7284 Chemistry of Proteins (3)

BIOL 7800 Neurophysiology (2-4)

BIOL 7800 Cell Biol of Nucleus (2-4)

BIOL 7800 Epigenetics (2-4)

BIOL 7901 Sem Neuroscience (1)

ENVS 4477 Enriv Tox: Intro & A (3)

ENVS 7110 Toxicology Aquatic Envr (3)

ENVS 7626 Genetic Toxicology (Toxicology IV) (3)

KIN 3514 Biomechanical Basis of Kinesiology (3)

KIN 4519 Cadaver Dissection (3)

KIN 7501 Advanced Research Methods (3)

KIN 7504 Tests and Measurements in Kinesiology (3)

PBS 7003 Special Topics: Molecular and Cellular Mechanisms of Host Responses to Infection (3)

APPENDIX A

CHECKLIST FOR COMPLETION OF DEGREE REQUIREMENTS FOR MASTER OF SCIENCE (BASED ON A 2 YEAR COMPLETION)

MATRICULATION DATE: _____

TO MEET CBS GUIDELINES: BY THE

END OF SEMESTER 1

_____ Choose Graduate Research Mentor

_____ Written request to the Department Head and Graduate Student Affairs Committee for Graduate Research Mentor assignment.

BY THE END OF SEMESTER 1

_____ Choose Graduate Advisory Committee

_____ Written request to the Department Head and Graduate Student Affairs Committee of formal Graduate Advisory Committee assignment.

BY THE END OF YEAR 1

_____ Identify a research problem

_____ Prepare a research proposal

_____ File a study plan with the Graduate Student Affairs Committee

_____ Have research proposal approved by Graduate Advisory Committee _____ Present

first seminar

COMPLETION OF CORE REQUIREMENTS:

VMED 7004 (semester); _____

CBS 7108 (semester): _____

CBS 7104 (semester): _____; _____

SEMINARS (dates): _____; _____

ANNUAL MEETINGS WITH Graduate Advisory Committee (dates): _____; _____

TO PREPARE FOR GRADUATION:

CHECK WITH THE GRADUATE SCHOOL FOR DATES AND TIMES OF DEADLINES:

Deadline for application for degree: _____

Deadline for request for final examination: _____

Deadline for Examination Report and

Submission of Approved Thesis: _____ Graduation:

_____

GRADUATION CHECKLIST:

_____ Complete course work and get approval from Graduate Advisory Committee and the Graduate School _____ Complete research project

_____ Set date for final examination with Graduate Advisory Committee

_____ Set date for final seminar with CBS Seminar Advisor

_____ File Application for Degree with the Graduate School

_____ File Request for Final Exam with Department Head and the Graduate School

_____ Complete thesis and distribute to members of Graduate Advisory Committee three weeks before examination

_____ Present Thesis Seminar

_____ Defend thesis

_____ Make all thesis corrections and submit thesis and Committee Examination Report to the Graduate School

_____ Submit four hard copies of thesis to CBS for binding

APPENDIX B

CHECKLIST FOR COMPLETION OF DEGREE REQUIREMENTS FOR DOCTOR OF PHILOSOPHY (BASED ON A 4 YEAR COMPLETION)

MATRICULATION DATE: _____

TO MEET CBS GUIDELINES:

BY THE END OF YEAR 1

_____ Choose Graduate Research Mentor

Student sends a written request to the Department Head and informs the Graduate Student Affairs Committee of formal Graduate Research Mentor assignment

BY THE END OF YEAR 1

_____ Choose Graduate Advisory Committee

Student sends a written request to the Department Head and informs the Graduate Student Affairs Committee of formal Graduate Advisory Committee assignment.

BY THE END OF YEAR 2

_____ Identify a research problem

_____ Prepare study and research proposal and have both approved by Graduate Advisory Committee

_____ File The Program of Study for the Doctoral Student form with the Graduate School

_____ Present first seminar

_____ Complete course requirements

_____ Submit "Request for General Examination" to Department Head 4 weeks before the examination date _____ Complete

General Examination

Note: The Graduate School requires that the General Examination be taken within 36 months of matriculation and at least two semesters before graduation. Check with the Graduate School for deadlines.

COMPLETION OF CORE REQUIREMENTS:

VMED 7004 (semester); _____

CBS7108 (semester): _____

SEMINARS (dates): _____; _____

TO PREPARE FOR GRADUATION:

CHECK WITH THE GRADUATE SCHOOL FOR DATES AND TIMES OF DEADLINES:

Deadline for application for degree: _____

Deadline for request for final examination: _____

Deadline for Examination Report and Submission of Approved Dissertation: _____ Graduation:

_____

GRADUATION CHECKLIST:

_____ Complete course work and get approval from Graduate Advisory Committee and the Graduate School _____ Complete research project

_____ Set date for final examination with Graduate Advisory Committee

_____ Set date for final seminar with CBS Seminar Advisor

_____ File Application for Degree with the Graduate School

_____ File Request for Final Exam with Department Head and the Graduate School

_____ Complete thesis and distribute to members of Graduate Advisory Committee three weeks before examination

_____ Present Dissertation Seminar

_____ Defend dissertation

_____ Make all dissertation corrections

_____ Submit dissertation and Committee Examination Report to the Graduate School

APPENDIX C

Checklist for completion of degree requirements

Master of science in combination with a dvm residency program (Based on a 3 year completion)

MATRICULATION DATE: _____

TO MEET CBS GUIDELINES:

BY THE END OF SEMESTER 1

_____ Choose Graduate Research Mentor (written request to both the Department Head and the Graduate Student Affairs Committee for assignment of a Graduate Research Mentor.)

_____ Choose Graduate Advisory Committee (inform both the Department Head and the Graduate Student Affairs Committee of the Graduate Advisory Committee membership in writing.)

BY THE END OF YEAR 1

_____ Identify a research problem

_____ Prepare a research proposal

_____ File a Program of Study with the Graduate School

_____ Have research proposal approved by Graduate Advisory Committee

_____ Present first seminar

ANNUAL MEETINGS WITH Graduate Advisory Committee (dates): _____; _____; _____

COMPLETION OF CORE REQUIREMENTS:

VMED 7004 (semester); _____

CBS7108 (semester): _____

CBS7104 (semester): _____

SEMINARS (dates): _____; _____

ANNUAL MEETINGS WITH Graduate Advisory Committee (dates): _____; _____

TO PREPARE FOR GRADUATION:

CHECK WITH THE GRADUATE SCHOOL FOR DATES AND TIMES OF DEADLINES:

Deadline for application for degree: _____

Deadline for request for final examination: _____

Deadline for Examination Report and Submission of Approved Thesis: _____

Graduation: _____

GRADUATION CHECKLIST:

_____ Complete course work and get approval from Graduate Advisory Committee and the Graduate School _____

Complete research project

_____ Set date for final examination with Graduate Advisory Committee

_____ Set date for final seminar with CBS Seminar Advisor

_____ File Application for Degree with the Graduate School

_____ File Request for Final Exam with Department Head and the Graduate School

_____ Complete thesis and distribute to members of Graduate Advisory Committee three weeks before examination

_____ Present Thesis Seminar

_____ Defend thesis

_____ Make all thesis corrections

_____ Submit thesis and Committee Examination Report to the Graduate School

_____ Submit four hard copies of thesis to CBS for binding

APPENDIX D

Checklist for completion of degree requirements for Doctor of Philosophy in combination with a dvm residency (Based on a 5 year completion)

MATRICULATION DATE: _____

TO MEET CBS GUIDELINES:

BY THE END OF THE YEAR 1

_____ Choose Graduate Research Mentor (written request to both the Department Head and the GA for assignment of a Graduate Research Mentor.)

_____ Choose Graduate Advisory Committee (inform both the Department Head and the Graduate Student Affairs Committee of the Committee membership in writing.)

BY THE END OF YEAR 2

_____ Identify a research problem

_____ Prepare a research proposal

_____ File a Program of Study with the Graduate School

_____ Have research proposal approved by Graduate Advisory Committee

_____ Present first seminar

_____ Complete course requirements

_____ Submit "Request for General Examination" to Department Head 4 weeks prior to examination date _____

Schedule General Examination

COMPLETION OF CORE REQUIREMENTS:

VMED 7004 (semester); _____

CBS 7008 (semester): _____

CBS 7104 (semester): _____

SEMINARS (dates): _____; _____

TO PREPARE FOR GRADUATION:

CHECK WITH THE GRADUATE SCHOOL FOR DATES AND TIMES OF DEADLINES:

Deadline for application for degree: _____

Deadline for request for final examination: _____

Deadline for Examination Report and

Submission of Approved Dissertation: _____ Graduation:

_____

GRADUATION CHECKLIST:

_____ Complete course work and get approval from Graduate Advisory Committee and the Graduate School _____ Complete research project

_____ Set date for final examination with Graduate Advisory Committee

_____ Set date for final seminar with CBS Seminar Advisor

_____ File Application for Degree with the Graduate School

_____ File Request for Final Exam with Department Head and the Graduate School

_____ Complete dissertation and distribute to members of Graduate Advisory Committee four weeks before xamination

_____ Present Dissertation Seminar

_____ Defend dissertation

_____ Make all dissertation corrections

_____ Submit dissertation and Committee Examination Report to the Graduate School

_____ Submit four hard copies of the dissertation to CBS for binding

APPENDIX E

Format for dissertation proposal

The study plan, which includes a brief biographical sketch, publications, courses taken and grades, proposed coursework, and dissertation research proposal, should be presented to the Graduate Advisory

Committee as early in the program as possible. The research proposal should follow the NIH R21 format. A copy of the study plan should be provided to the Graduate Student Affairs Committee and each member of the Graduate Advisory Committee at least two (2) weeks before the Graduate Advisory Committee meeting and should use the following format: 1. Title page

2. Brief biographical sketch (1 page)

3. Publications and presentations

4. List of courses taken and grades or a copy of transcript(s)

5. Planned course schedule

6. Proposal

6.1. Project Summary - The proposal must contain a project summary (abstract). The project summary itself should be approximately 250 words. The project summary should be a self-contained, specific description of the activity to be undertaken and should focus on:

- Overall project goal(s), hypothesis and supporting objectives
- Plans to accomplish project goal(s).

6.2. Specific Aims (1 page) - State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved. List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.

GRADUATION CHECKLIST:

_____ Complete course work and get approval from Graduate Advisory Committee and the Graduate School

_____ Complete research project

_____ Set date for final examination with Graduate Advisory Committee

_____ Set date for final seminar with CBS Seminar Advisor

_____ File Application for Degree with the Graduate School

_____ File Request for Final Exam with Department Head and the Graduate School

_____ Complete dissertation and distribute to members of Graduate Advisory Committee four weeks before examination

_____ Present Dissertation Seminar

_____ Defend dissertation

_____ Make all dissertation corrections

_____ Submit dissertation and Committee Examination Report to the Graduate School

_____ Submit four hard copies of the dissertation to CBS for binding

APPENDIX F

Progress Evaluation Format

Student Name: _____

Research Mentor: _____

Date: _____

Degree Sought: _____

Overall Progress (Circle one):

Satisfactory Needs Improvement Unsatisfactory

_____

Academic Progress:

Research Progress:

Presentations Given:

_____ _____

Student Graduate Research Mentor

_____ _____ _____

Committee Members: 1 2 3

_____ _____

Graduate Advisor Department Head

School of
Veterinary Medicine

Comparative Biomedical Sciences

lsu.edu/vetmed/cbs