



## **Handbook of Procedures and Guidelines**

*Department of Physiology*  
*Graduate School of Biomedical Sciences*  
The University of Texas Health Science Center at San Antonio

7703 Floyd Curl Drive  
San Antonio, TX 78229  
(210) 567-4324

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## **OVERVIEW**

This handbook is designed to guide a student through his/her academic career. Further details of the basic procedures and regulations of the Biomedical Graduate School at UTHSCSA are found in the UTHSCSA Catalog, which can be found on-line at [http://studentservices.uthscsa.edu/GI\\_catalog.aspx](http://studentservices.uthscsa.edu/GI_catalog.aspx).

This Handbook and the UTHSCSA Catalog is not intended to nor does it contain all regulations that relate to students. The provision of the Handbook and Catalog does not constitute a contract, express or implied, between any applicant, student or faculty member and UTHSCSA. UTHSCSA reserves the right to withdraw courses at any time, and to change fees, tuition, calendar, curriculum, degree requirements affecting students. Changes will be effective whenever the proper authorities so determine and will apply to both prospective students and those already enrolled.

## **REQUIREMENTS FOR ADMISSION**

Applicants are required to have a minimum of a Bachelor's degree. Applicants should have received credit for courses taken in:

Biology	2 yrs as required for science majors
Chemistry	1 yr organic and inorganic chemistry; analytical and physical chemistry are recommended
Physics	1 yr Mathematics
Mathematics	Minimum of 1 semester of calculus

\* courses should include laboratory experience

All applicants must take the Graduate Record Examination (GRE) and all international applicants must take the Test of English as a Foreign Language (TOEFL). The GRE must be taken within the last 5 years and the TOEFL within the last 2 years. The minimum required scores for the TOEFL are 560 for the paper test, 220 for the computer test, and 68 for the internet test.

## **THE COMMITTEE ON GRADUATE STUDIES (COGS)**

The Committee on Graduate Studies (COGS) administers the Graduate Program in Physiology. This committee is comprised of members of the physiology graduate faculty and one student representative. The COGS is responsible for coordinating activities in the physiology program, responsibilities include, but are not limited to, defining the curriculum, establishing procedures, assigning of Supervising Professors, evaluating students, and other pertinent policy matters. Meetings are held on the first Wednesday of every month and special meetings can be called at the discretion of the COGS chair.

This committee is composed of 7 voting members and 2 non-voting, ex-officio members (Appendix I). Of the 7 voting members 1 is a student and 6 are faculty. COGS members are elected by the Physiology graduate faculty; with two faculty members elected each year to serve a three year term. Every other year, one of the two newly elected members will be selected by the Physiology graduate faculty to serve as Chair-elect; this member will serve as Chair of COGS during the final two years of their term. The student member is chosen by the graduate students of the program and serves for one year. The student representative participates in all activities of the Committee except in evaluation of students in the graduate program.

The Chair of COGS is designated as the Graduate Advisor and is responsible for making decisions in accordance with established program policy. These decisions include the following: approval of rotation assignments, approval of course substitutions, advancement to candidacy, placement of students onto academic probation, and lifting of probation when students complete remedial requirements. It is the responsibility of the Chair to keep the committee informed of the status of all graduate students. The Chair should seek a majority vote of committee prior to any of the following: recommending dismissal of a student from the program, granting unprecedented course substitutions, establishing new policies, denying petitions, assigning students permanently to Supervising Professors, granting a change of Supervising Professor, or waiving any program requirements.

## **PROGRAM FACULTY AND MEMBERSHIP**

It is understood that membership in the Physiology Graduate Program and designated track carries with it the agreement to contribute meaningfully to graduate education in the form of mentoring dissertation or thesis research, serving on research guidance committees, teaching in graduate courses, attending student seminars or other student presentations and/or participating in faculty committees relevant to the physiology graduate program.

Each faculty member who wants to participate in the activities must complete a Track Credentialing Request Form and attach a current e-curriculum vitae, a statement of mentoring experience, and a statement of funding support for a graduate student stipend. The latter two statements are needed only for faculty members requesting credentialing as a mentoring faculty member. The faculty member obtains the signature of his/her department chair and if appropriate center/institute director and submits the original, signed Track Credentialing Request Form and attached documents to the Graduate Dean's Office. The faculty member also should send a pdf of the completed application to the Graduate Dean's Office. See IMG P track credentialing guidelines for more details. Form and guidelines located at <http://gsbs.uthscsa.edu/facultystaff/resources> (scroll down to Forms, IMG P Track Credentialing).

To keep the membership in the Physiology Graduate Program and designated track current and in agreement with the guidelines of the Graduate School of Biomedical Sciences, each year at the June meeting COGS will consider one-third of the membership of continuation in the program. Any member who, by majority agreement of the members of COGS, has not met the guidelines for the past three years will be notified by the Chair of COGS and asked whether there is interest in continuing membership in the program and, if so, how the guidelines will be met. Failure to reply will be taken as a lack of continuing interest. Reconsideration of those faculty so notified will take place the following June.

For the initial three years, reviews will be of the top, middle and bottom thirds (alphabetically) of the current members of the program, excepting those who had been members for less than three years. Thereafter, each member of the program will be reviewed for continuation in the program every three years.

## **REQUIRED COURSES/COURSE DESCRIPTIONS**

Physiology is the study of the structure, function, and integration of the human body. In the pioneering days, research efforts were primarily directed at tissues and organs. This research continues to this day and has resulted in a comprehensive picture of the function of the human body. As molecular and genetic methods have come of age, physiologists have implemented these

techniques to elucidate the molecular mechanisms that underlie physiological function. It is now clear that in order to develop a complete understanding of the normal and dysfunctional human body, we must ask questions at all levels, from the molecular to the cellular, to the organ, to the whole organism. The track that represents the Department of Physiology is the Molecular, Cellular, and Integrative Physiology (MCIP) track which is based on integrating understanding of protein and cellular function from the molecule to the whole animal.

### **Molecular, Cellular, and Integrative Physiology Track (MCIP)**

Track Co-leaders: Robert Brenner, Ph.D. and Mark Shapiro, Ph.D.

#### *Fall Semester I*

#### **INTD 5008 IMGP Laboratory Rotations**

2 Credit Hours

This course provides an opportunity for students to participate in research activities in the laboratories of faculty members in different tracks to learn laboratory skills and to gain an introduction to the research fields of faculty members. Required Fall and Spring of first year.

#### **INTD 5000 Fundamentals of Biomedical Sciences**

8 Credit Hours

This is a core course covering the fundamentals of biochemistry, molecular biology, cell biology, microbiology, immunology, and organismal & systems biology. The course is designed for first year graduate students matriculating into the integrated, multidisciplinary graduate program.

#### *Spring Semester I*

#### **INTD 5008 IMGP Laboratory Rotations**

2 Credit Hours

This course provides an opportunity for students to participate in research activities in the laboratories of faculty members in different tracks to learn laboratory skills and to gain an introduction to the research fields of faculty members. Required Fall and Spring of first year.

#### **PHYL 5045 Mammalian Physiology**

4 Credit Hours

This course begins with fundamental processes that govern membrane transport, membrane potential, and excitation-contraction coupling. The course then proceeds to coverage of organ system function including cardiovascular, respiratory, renal, gastrointestinal and endocrine/metabolic physiology. Lecture material is enhanced by supplemental discussion of research literature encompassing molecular biology, integrative function, and pathophysiological implications.

#### **Mammalian Physiology Modules:**

##### **PHYL 5041 - Excitable Membranes**

1 Credit Hour

This course addresses fundamental mechanisms of cell excitability in neurons and other excitable tissues. The format is a combination of lectures, readings/discussion, laboratory demonstrations, and simulation software (where available). Examples of the latter include software to simulate the resting membrane potential, action potentials, and synaptic events. This module will emphasize contemporary issues in the scientific literature as well as translational science where dysfunction in channels and synapses underlie common disorders

such as Alzheimer's Disease, Myasthenia Gravis, Cystic Fibrosis, Long QT Syndrome, and Epilepsy to name just a few.

**PHYL 5042 - Cardiovascular Physiology**

1 Credit Hour

The course explores the physiological mechanisms by which the cardiovascular system carries out its principle functions. Mechanisms that produce and regulate cardiac pumping, organ blood flow, capillary fluid and solute exchange, and arterial blood pressure are examined. The nature and importance of various local, neural, and hormonal mechanisms are emphasized. Integrated control of cardiovascular function in situations requiring cardiovascular adjustments (e.g., exercise, blood pressure alterations) are also covered.

**PHYL 5043 – Respiratory & Renal Physiology**

1 Credit Hour

This course covers the physiology of respiratory and renal function in the human body. Our focus is on basic mechanisms of function, role in body homeostasis, as well as dysfunction of both systems associated with pulmonary and renal disease. Two sessions are set aside for discussion around significant advances in each field. One or more recently published articles that will serve as the focus for each of these discussion sessions.

**PHYL 5044 - Endocrine/Metabolism & Gastrointestinal Physiology**

1 Credit Hour

The course serves to expose students to the current state of knowledge in the field of endocrinology and metabolism, including reproductive physiology, and the related topics of the physiology of the digestive tract. Three sessions are assigned to advanced topics. In these three sessions students will engage in a discussion format centered around one recent important publication. The lecturer will lead the discussion with the aim of showing how the topics the students have been exposed to integrate one with another, providing the context for present day discoveries.

*Summer Semester I*

**PHYL 6097 – Research**

6 credit hours

*Fall Semester II*

**PATH 5021 Introduction to Biostatistics**

3 Credit Hours

Emphasis is upon application of statistical methods to biological problems. Topics include descriptive statistics, probability, hypothesis testing and estimation.

**OR**

**CSBL 5095 Experimental Design & Data Analysis**

2 Credit Hours

The purpose of this course is to provide an introduction to experimental design and statistical analysis. The emphasis of the course will be on the selection and application of proper tests of statistical significance. Practical experience will be provided in the use of both parametric and nonparametric methods of statistical evaluation. Among the topics to be covered are: data reduction, types of distributions, hypothesis testing, scales of measurement, chi square analysis, the special case of the comparison of two groups, analysis of variance, a posteriori multiple range tests, tests of the assumptions of parametric analyses, advanced forms of the analysis of variance, linear regression and correlation analysis.

**PHYL 6091 Selected Topics in Physiology\***

2 Credit Hours

**PHYL 6090 Seminar**

1 Credit Hour

The course is comprised of research presentations by Physiology graduate students. This course is required of all students each semester.

**PHYL 6097 Research**

Credit Hours TBD

*Spring Semester II*

**INTD 6002 Ethics in Research**

0.5 Credit Hours

This course will deal with topics relevant to ethics in scientific research. The course will be taught on a "case study" basis, dealing with real and hypothetical situations relevant to the conduct of scientific research. Topics discussed will include, but will not be limited to: data management, peer review, recognizing scientific misconduct, authorship and The University of Texas regulations relevant to human and animal research.

**PHYL 6091 Selected Topics in Physiology\***

2 Credit Hours

**PHYL 6090 Seminar**

1 Credit Hour

The course is comprised of research presentations by Physiology graduate students. This course is required of all students each semester.

**PHYL 6097 Research**

Credit Hours TBD

**Qualifying Examination (QE) proposal due prior to May 1<sup>st</sup> (see QE section)**

*Remaining Semesters*

***Summer***

**PHYL 6097 – Research**

6 Credit Hours

*Fall/Spring*

**PHYL 6090 – Seminar**

1 Credit Hour

The course is comprised of research presentations by Physiology graduate students. This course is required of all students each semester. **Required each semester through graduation.**

**PHYL 7099 – Dissertation**

8 Credit Hours

OTHER COURSES- Selected topics in physiology or coursework as desired by mentor.

**All students are required to submit a dissertation research proposal the Spring semester following passing the qualifying exam. Dissertation research proposal is to be presented during the PHYL 6090 Spring Student Seminar course (see Guidelines for Dissertation Proposal Section).**

\*Students are required to attend Monday Physiology Department Seminars/Special Seminars followed by student roundtable luncheon.

\*\*\*\*\*

**\*SELECTED TOPICS IN PHYSIOLOGY (PHYL 6091)**

2 Credit Hours

At least two courses selected from among the offerings in:

PHYL 6091-01: Cardiovascular

PHYL 6091-03: Cell Biology in Neural Science

PHYL 6091-04: Endocrine and Metabolism

PHYL 6091-05: Molecular Physiology

PHYL 6091-07: Ion Channels in Disease

Courses that may be substituted for one of these selections:

INTD 5040: Fundamentals of Neuroscience I: Molecular, Cellular & Developmental Neuroscience (3 Credit Hours)

INTD 5043: Fundamentals of Neuroscience II: Systems Neuroscience (3 Credit Hours)

INTD 7002: Neurobiology of Learning and Memory (1 Credit Hour )

CSBL 6058: Neurobiology of Aging (2 Credit Hours)

\*Not all selected topics are offered each semester, please discuss with Track Leader/Academic Coordinator for more details. Substituted courses will require approval from Track Leader/COGS.

**Molecular, Cellular, and Integrative Physiology Track (MCIP) - MD/PhD Program**

*Year 1 of Dual Degree*

Summer – Lab Rotation 1

Fall – Medical Courses

Spring – Medical Courses

*Year 2 of Dual Degree*

Summer – Lab Rotation 2 & 3  
Fall – Medical Courses  
Spring – Medical Courses

*Year 3 of Dual Degree; Year 1 of Graduate School  
Summer Semester*

**PHYL 6097 – Research**

6 credit hours

*Fall Semester*

**PATH 5021 Introduction to Biostatistics**

3 Credit Hours

Emphasis is upon application of statistical methods to biological problems. Topics include descriptive statistics, probability, hypothesis testing and estimation.

**OR**

**CSBL 5095 Experimental Design & Data Analysis**

2 Credit Hours

The purpose of this course is to provide an introduction to experimental design and statistical analysis. The emphasis of the course will be on the selection and application of proper tests of statistical significance. Practical experience will be provided in the use of both parametric and nonparametric methods of statistical evaluation. Among the topics to be covered are: data reduction, types of distributions, hypothesis testing, scales of measurement, chi square analysis, the special case of the comparison of two groups, analysis of variance, a posteriori multiple range tests, tests of the assumptions of parametric analyses, advanced forms of the analysis of variance, linear regression and correlation analysis.

**PHYL 6091 Selected Topics in Physiology\***

2 Credit Hours

**PHYL 6090 Seminar**

1 Credit Hour

The course is comprised of research presentations by Physiology graduate students. This course is required of all students each semester.

**PHYL 6097 Research**

Credit Hours TBD

*Spring Semester*

**INTD 6002 Ethics in Research**

0.5 Credit Hours

This course will deal with topics relevant to ethics in scientific research. The course will be taught on a "case study" basis, dealing with real and hypothetical situations relevant to the conduct of scientific research. Topics discussed will include, but will not be limited to: data management, peer review, recognizing scientific misconduct, authorship and The University of Texas regulations relevant to human and animal research.

**PHYL 6091 Selected Topics in Physiology\***

2 Credit Hours

**PHYL 6090 Seminar**

1 Credit Hour

The course is comprised of research presentations by Physiology graduate students. This course is required of all students each semester.

**PHYL 6097 Research**

Credit Hours TBD

**Qualifying Examination (QE) proposal due prior to May 1st**

*Year 4 and beyond of Dual Degree  
Summer*

**PHYL 6097 – Research**

6 Credit Hours

*Fall/Spring*

**PHYL 6090 – Seminar**

1 Credit Hour

The course is comprised of research presentations by Physiology graduate students. This course is required of all students each semester. **Required each semester through graduation.**

**PHYL 7099 – Dissertation**

8 Credit Hours

OTHER COURSES- Selected topics in physiology or coursework as desired by mentor.

**All students are required to submit a dissertation research proposal the Spring semester following passing the qualifying exam. Dissertation research proposal is to be presented during the PHYL 6090 Spring Student Seminar course .**

\*Students are required to attend Monday Departmental Seminars/Special Seminars followed by student roundtable luncheon.

\*Student given credit for INTD 5000 Fundamentals of Biomedical Sciences via Medical Biochemistry

\*Student given credit for PHYL 5041 Mammalian Physiology via Medical Physiology.

\*\*\*\*\*

**\*SELECTED TOPICS IN PHYSIOLOGY (PHYL 6091)**

2 Credit Hours

At least two courses selected from among the offerings in:

PHYL 6091-01: Cardiovascular

PHYL 6091-03: Cell Biology in Neural Science

PHYL 6091-04: Endocrine and Metabolism

PHYL 6091-05: Molecular Physiology

PHYL 6091-07: Ion Channels in Disease

Courses that may be substituted for one of these selections:

INTD 5040: Fundamentals of Neuroscience I: Molecular, Cellular & Developmental Neuroscience (3

Credit Hours)

INTD 5043: Fundamentals of Neuroscience II: Systems Neuroscience (3 Credit Hours)

INTD 7002: Neurobiology of Learning and Memory (1 Credit Hour)

CSBL 6058: Neurobiology of Aging (3 Credit Hours)

\*Not all selected topics are offered each semester, please discuss with Track Leader/Academic Coordinator for more details. Substituted courses will require approval from Track Leader/COGS.

### **FULL-TIME STATUS**

The minimum full time course load for the Fall/Spring semester is 9 hours, and 6 hours for the summer semester. Graduate students are required to maintain full time status until the completion of their graduate studies.

### **ADDING/DROPPING COURSES/REFUNDS**

Students may add courses during official add days as designated by the Registrar's Office each semester. Students are not permitted to add classes to their schedules after the census date, which is the 12<sup>th</sup> class day of the Fall and Spring semesters, or the 7<sup>th</sup> class day of the summer semester.

Through the ninth week of Fall or Spring semester or the seventh week of Summer session, a student who is not on academic probation may drop a course provided the student is passing the course at the time and has the signed approval of the instructor.

100% of tuition and fees will be refunded for courses dropped prior to the census day of the term provided the student remains enrolled in the institution for that term. No refunds will be made for courses dropped following the census day of term unless the student withdraws from the university, the Fee Refund Schedule will be used to determine refund eligibility.

### **STIPEND SUPPORT**

The Graduate School of Biomedical Sciences (GSBS) offers financial assistance in the form of teaching and research assistantships to full-time students admitted to the IMGDP doctoral program. The annual salary is \$26,000 which will readily cover all living and educational expenses. Tuition and fees will also be paid for the student. All support is provided by the GSBS in year 1 and by dissertation supervising professors beginning in year 2 of the program. Students may also apply for stipend support from training grants associated with specific areas of research.

### **GRADING SYSTEM**

Credit hours are earned only for the grades **A**, **B**, and **C**. However, all **D** and **F** grades are included in the computation of the grade point average. Grade points are assigned as follows:

A = 4 (above average graduate work)

B = 3 (average graduate work)

C = 2 (below average graduate work)

D = 1 (failing graduate work)

F = 0 (failing graduate work)

Grades **D** and **F** are not acceptable for graduate credit. If a course is repeated, the last grade earned is used in computing the cumulative grade point average.

### **ACADEMIC STANDING**

Students must maintain a minimum 3.0 cumulative grade point average. A student whose cumulative grade point average (GPA) falls below 3.0 will be placed on academic probation. A student remains on academic probation as long as his/her cumulative GPA remains below 3.0. While on probation, a student must maintain a B average in his/her registered courses or may be considered for dismissal by the COGS and/or the Dean. The Chair of COGS notifies the student in writing of the basis for the probation, the requirements to rectify the probation, and the time allotted to complete these requirements (usually one semester). A student on probation may not be admitted to candidacy. COGS may recommend to the Dean of the Graduate School the dismissal of a student at any time for failure to make satisfactory progress. A majority vote of the members of COGS is required for a recommendation of dismissal.

### **LABORATORY ROTATIONS**

As defined by the Integrated Multidisciplinary Graduate Program.

### **DEPARTMENTAL SEMINARS AND ROUNDTABLE LUNCHES**

The Department of Physiology sponsors a weekly seminar series, which features invited guest scientists of high national and international reputation to present their research findings. Because the series covers a diverse range of research topics in the broadly defined area of Physiology, it is of great value to the student's academic development. Each seminar is followed by a Roundtable Lunch, which affords the student an opportunity to interact with the esteemed guest in an informal setting, to discuss science, graduate education, and/or career planning. Student attendance at Departmental Seminars is mandatory, and approximately 6-8 students choose or are chosen to attend roundtable lunches each week.

### **SEMI-ANNUAL PROGRESS REPORTS**

Semi-annual progress reports are due to the Committee on Graduate Studies by Jan. 31 and July 31, each year the student is enrolled in graduate study. See Appendix II. Semi-annual reports should include, but are not limited to, specific aims for the time period, results including methodology, discussion, references, publications/manuscripts, and specific aims for the next six months.

Reports should be sufficiently thorough to permit evaluation of progress but not excessive in length. Copies of figures and tables, with legends, may be appended. The student should pay particular attention to stating hypotheses and whether the experiments described completely test the stated hypotheses. For students with an approved Supervising Committee, the report will be distributed to members of the Committee one week prior to the meeting.

The Committee on Graduate Studies will inform each student whether his/her progress is satisfactory or unsatisfactory twice per year. Should a student's progress be considered unsatisfactory, the Committee on Graduate Studies will identify in what way(s) the student's progress is less than

satisfactory and suggest actions the student can take to improve his/her progress. Satisfactory progress is important because unsatisfactory progress is grounds for dismissal from the program.

## **QUALIFYING EXAMINATION**

Aims: The objectives of the Qualifying Examination are to evaluate the research potential of the student, to evaluate the student's progress towards becoming a scientist, and to evaluate the student's understanding of and ability to integrate physiological principles.

Composition of the Test Committee and Examination Panel: The Test Committee (Appendix I) is responsible for overseeing and administering the Qualifying Examination. The Committee is comprised of four members, selected by the Committee on Graduate Studies, from within the Physiology Graduate Faculty. The chairperson of this committee will also be selected by the Committee on Graduate Studies. Members of the Test Committee will serve terms of two years, with two members replaced annually.

The Examination Panel is the group of faculty responsible for evaluating the student's written research proposal, and for questioning the student during the oral exam phase. Each student's Examination Panel will be comprised of two of the four standing members of the Test Committee, as well as two *ad hoc* members. One of the two members of the Examination Panel that is also on the Test Committee will serve as the chair of the Examination Panel. If possible, the *ad hoc* members of the Examination Panel should have expertise in the area of the student's research proposal. All *ad hoc* members will be chosen by the student and approved by the Chair of the Test Committee, with at least one *ad hoc* member selected from within the Physiology Graduate Faculty, and at least one from outside the Physiology Graduate Program. It is possible to have additional members of the Test Committee serve as *ad hoc* members of the Examination Panel, but this is not encouraged.

Scheduling of the exam: The examination will be given to doctoral students after successful completion of the second year of coursework but prior to August 1 of that year. Any deviation from this schedule must be approved in advance by the Test Committee.

The written research proposal will be submitted to the Chair of the Test Committee and the student's Examination Panel will read the proposal. If the written proposal is judged satisfactory, then the student must contact the Examination Panel to schedule an appropriate date for the presentation and examination, typically within six to eight weeks after the written proposal's submission date. **Written proposals MUST be submitted prior to May 1.** If the proposal is late or deemed insufficient or unsatisfactory, the Examination Panel will provide generalized feedback to the student to facilitate editing/rewriting. The revised proposal will be re-submitted with all due haste on a date established by the Examination Panel for re-evaluation. **Only one revision/resubmission will be accepted within the examination period.** If the revised proposal is late or remains unsatisfactory, then COGS will evaluate the student's potential to progress toward their Ph.D. and decide if the student should be given additional time to complete their QE.

Format of the exam: The examination will consist of a written research proposal of no more than 10 total pages (references excluded; details on this are given below), in conjunction with a presentation of the proposal, followed by an oral (verbal) examination phase. The written research proposal will be used to measure the student's independent thinking and writing abilities. Thus, significant and

specific help from faculty and peers should be restricted. The student is free to discuss his/her ideas with peers and mentors and to receive generalized criticisms from these sources during the development of the proposal. However, the final proposal must be an independent product of the student and may not share one or more Specific Aims with any grant written by the mentor. Mentors and students should be guided by the idea that the proposal is the student's, not the mentor's, and the student will have to defend it during the oral examination period. The Qualifying Exam should be written in the format of a mock grant that proposes to test one or more novel scientific hypotheses. Developing methodology (e.g., inventing an assay or making a transgenic mouse), while potentially noteworthy, in most cases will not be sufficient.

In general, the line of questioning during the examination phase will be derived from the subject matter of the written research proposal, but the questions may be broad in scope, to allow the committee to evaluate fully the student's knowledge of basic physiological principles. The examination phase will be followed immediately by a closed evaluation phase, during which the examination panel will discuss and evaluate the student's performance.

The student's Supervising Professor may **not** serve on that student's Examination Panel, either as a standing or *ad hoc* member. The Supervising Professor may be present during the oral examination phase, but will be excused from the panel's evaluation phase (during which the pass/fail decision is discussed and rendered).

**Format of the Research Proposal:** The proposal will be written as a single-spaced document that is a **maximum of 10 pages** (exclusive of references) and includes the following sections (modified from NIH pre-doctoral NRSA guidelines).

### **Specific Aims**

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, or challenge an existing paradigm or clinical practice.

Specific Aims are limited to one page.

### **Research Strategy**

Organize the Research Strategy in the specified order using the instructions provided below. Start each section with the appropriate section heading — Significance, Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section.

#### **(a) Significance**

- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.

- Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

**(b) Approach**

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. 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 an applicant has multiple Specific Aims, then the applicant may address Significance and Approach for each Specific Aim individually, or may address Significance and Approach for all of the Specific Aims collectively.

**Bibliography and References Cited**

List complete citations with all authors and titles. No page limit.

The main body of the text should use parenthetical citations in APA style including the first author's name and publication year (e.g., White et al., 2011; Black and Brown, 2009) and should not use numerical footnotes or endnotes (e.g., <sup>26-31, 33</sup>).

**Format**

Use Arial or Helvetica font with a minimum of 11 point text and 12 point line spacing. Margins should be a minimum of 0.5 inches on all sides.

You may include figures plus figure legends in the text, but these count toward the page limits. They should be clearly visible and readable. If you need to reproduce a figure from the literature, make sure it is labeled as "reproduced from..."

The research proposal must include a sub-section (under Significance) that explicitly addresses the biomedical relevance of the proposed research, and its relation to human physiology or disease. The proposal should also include sections describing experimental procedures and the statistical tests that will be used. Preliminary data is not explicitly required but may be used to strengthen the proposal.

Attendance of the presentation: All faculty, postdoctoral fellows, and graduate students who wish to attend the oral presentation of the research proposal may do so. Although the Examination Panel may schedule time for the audience to ask questions concerning the presentation, only Examination Panel members will be present for the formal examination.

Pass/Fail and re-examination: The student will pass the Qualifying Examination if no more than one member of the Examination Panel dissents. Only passing and failing grades will be assigned. Conditional pass and pass with remediation will not be allowed; however, one re-examination may be allowed for students that fail. A re-examination of the Qualifying Examination shall be conducted by the Examination Panel as comprised at the time of the initial examination. Re-examination must be completed within 3 months of the original oral examination.

The Chair of the Test Committee will report, by memorandum, the outcome of the examination to the Committee on Graduate Studies. Students who successfully complete the Qualifying Examination may proceed to the dissertation phase of the program.

Failure of the Qualifying Exam could result in COGS recommendation to Dean of the Graduate School that the student be dismissed from the program. Following failure of the Qualifying Examination or re-examination, COGS may be petitioned by the student and the student's Supervising Professor to allow a change to the Master of Science Program.

### Physiology Qualifying Exam -- Frequently Asked Questions

1. Q: May I ask my Supervising Professor for help with my written proposal? A: “The written research proposal will be used to measure the student’s independent thinking and writing abilities. Thus, significant and specific help from faculty and peers should be restricted. ... The final proposal must be an independent product of the student. Mentors and students should be guided by the idea that the proposal is the student’s, not the mentor’s, and the student will have to defend it during the oral examination period.” Note: These instructions are not intended in any way to inhibit the usual interactions you have with your Supervising Professor, including discussion of your thesis research.

2. Q: May I get help from my labmates/fellow students/postdocs, etc. with my oral presentation? A: “The student is free and encouraged to discuss his/her ideas with peers and mentors and to receive generalized criticisms from these sources during the development of the proposal.” You may and SHOULD practice your proposal presentation with an audience of your peers. This is important, to gain as much experience as possible in defending your proposal. Request that your audience ask you difficult questions and practice answering them.

3. Q: What is the procedure for assembling an Examination Panel? A: In conjunction with your Supervising Professor, select one member of the Physiology Graduate Faculty and one member of the Graduate Faculty of another program. These individuals should be experts in one or more areas of the topic of your proposal. Two members of the Test Committee will be assigned to your Examination Panel. When you have selected the two faculty members, ask them if they are willing to be members of your Examination Panel. Send them a copy of your proposal (or just the Specific Aims) so that they know the topic of your proposal.

### **GUIDELINES FOR THE DISSERTATION PROPOSAL**

All students in the Physiology graduate program are required to submit a dissertation research proposal during the Student Seminar Spring semester course (April/May) following successful completion of the Qualifying Examination. A copy of the dissertation research proposal must be submitted to COGS at least one week prior to the seminar date. The ideas that underlie the proposal are to be developed by the student with the guidance of their Supervising Professor, and the Supervising Professor may edit the proposal. However, the writing of the proposal must primarily represent the work of the student. The student will be required to make an oral presentation of the proposal, followed by a question and answer session, prior to its final approval by COGS. Students are also required to meet with their dissertation committee at least once prior to their oral presentation.

**Format:**

The format of the proposal should follow the same format as the written component of the Qualifying Exam as described in detail earlier in this handbook. It should contain three sections, under the headings: 1) Specific Aims, 2) Research Strategy (including Significance and Approach), 3) Bibliography and References Cited. The first two sections of the proposal **must not exceed 10 pages in length**, single-spaced, using a font size of 11 point or larger. **Any proposal that does not adhere to these standards will not be accepted.**

Although there are three required *major* sections in the proposal, the student is strongly encouraged to use sub-headings, where appropriate, to increase readability.

**RESPONSIBILITIES OF THE SUPERVISING PROFESSOR AND SUPERVISING COMMITTEE**

Students who do not yet have a Supervising Committee shall summarize their progress in the format described in the Semi-Annual Report section of this Handbook. The student shall meet with the Supervising Professor to review his/her report and to discuss their progress in the program. The Supervising Professor shall evaluate the progress report on the appropriate form contained in the Appendix II. It is the student's responsibility to provide the Supervising Professor with the form. The student provides a copy of the completed forms to the Supervising Professor and the Chair of COGS. In addition, the Supervising Professor gives a grade of satisfactory or unsatisfactory for research credits taken by the student (PHYL 6097).

The student who has formed a Supervising Committee shall meet with his/her committee at least once every six months. The Supervising Committee has the responsibility of reading and approving the dissertation proposal, supervising the research and evaluating the student's progress, reading and approving the written dissertation, and conducting the final oral defense. The committee must unanimously approve the written dissertation prior to scheduling of the final oral defense.

Research progress is evaluated at the semi-annual meetings of the student with the Supervising Committee. Each semester, a progress report is submitted by the student to each member of the Supervising Committee at least one week before the meeting. After each committee meeting, each member of the Supervising Committee evaluates both the oral presentation and the progress report on the appropriate form contained in the Appendix II. It is the student's responsibility to provide the Committee members with the appropriate form along with the progress report. The student will collect the forms after the meeting, and will provide a copy of the set of completed forms to each member of the Supervising Committee and to the Chair of COGS.

**REGISTRATION FOR DISSERTATION**

Students in the Ph.D. program may register for the dissertation course (PHYL 7099) only after all of the following actions have been taken:

1. Approval of admission to candidacy for the Ph.D. degree by the Dean;
2. Approval of the dissertation research proposal by the COGS and the Dean

A candidate for the Ph.D. degree must register for the dissertation course for at least two terms. Only one of the terms may be a summer session.

**PROCEDURE FOR DISSERTATION FORMATTING**

The Graduate School of Biomedical Sciences has transitioned to electronic-only submission of dissertations. A set of guidelines for electronic submission is available on the Graduate School website (scroll down to Instructions for Electronic Submission of Theses and Dissertation): <http://gsbs.uthscsa.edu/main/currentstudents/currentstudentresources>.

## **GUIDELINES FOR PLANNING YOUR GRADUATION**

Key Dates:

<hr/> <b>5 weeks*</b> <hr/>	Provide electronic draft of dissertation or thesis, the "Request for Final Oral" form 40 (with original signatures of all members including outside member, no faxes accepted), and 3 copies of your abstract and vita to Janice Stong in the Graduate Dean's Office.
<hr/> <b>4 weeks*</b> <hr/>	Schedule your defense <b>prior</b> to this date to allow time for revisions to be made to your dissertation or thesis.
<hr/> <b>2 weeks*</b> <hr/>	Submit the <b>final</b> electronic version of your thesis or dissertation, the signed "Report on Final Oral" form 43, and the signed Approval Page (100% cotton bond) with original signatures to Janice Stong in the Graduate Dean's Office for approval by the Dean.
<hr/> <b>1 week*</b> <hr/>	On this date the Graduate Faculty Council (GFC) meets, and your COGS chairperson will report the outcome of your defense and present the COGS recommendation that you are qualified to receive the degree.
<hr/>	Graduate School Commencement Date (see Academic Calendar)* located at <a href="http://studentservices.uthscsa.edu/GI-AcadCalGrad.aspx">http://studentservices.uthscsa.edu/GI-AcadCalGrad.aspx</a>

A completed "Application for Degree/Diploma Name Request" must be filed during the semester in which the candidate expects to graduate. Forms are available at [http://studentservices.uthscsa.edu/CS\\_Forms.aspx](http://studentservices.uthscsa.edu/CS_Forms.aspx).

## **FINAL ORAL EXAMINATION**

The Final Oral Examination consists of a public defense of the dissertation, followed by intensive questioning by the Supervising Committee. The final examination will cover the area of the dissertation and related topics. Interested persons may attend the public defense and have the right to question the candidate. After the public defense, the Final Oral Examination continues with an intensive oral examination by the Supervising Committee, which is not open to the public. The outcome of the examination is determined by vote of the Committee members. More than one negative vote constitutes failure of the examination. At the completion of the examination, the Supervising Committee will inform the Committee on Graduate Studies that:

- (a) the student passed the examination and recommends awarding the Ph.D. degree.
- (b) the student failed the examination and recommends
  - (i) a second examination following remedial steps by the student.
  - (ii) termination from the program.

Failure of a second examination will result in dismissal from the program.

Forms to be completed and signed by all Supervising Committee following the oral examination:

- GSBS Form 43: Report on Final Oral Examination
- Dissertation Facepage on 100% cotton bond

## **FINAL ACTION OF THE COMMITTEE ON GRADUATE STUDIES**

The Supervising Professor reports the outcome of the Final Oral Examination to the Committee on Graduate Studies and, when passed, recommends the student be awarded the Ph.D. The Committee on Graduate Studies (COGS) endorses or rejects the recommendation of the Supervising Committee. When endorsed, the Chair of the Committee on Graduate Studies ensures that all other degree requirements are complete and recommends to the Graduate Faculty Council that the student be awarded the Ph.D. To receive the Ph.D., the recommendation of the Physiology Committee on Graduate Studies must be endorsed sequentially by the Graduate Faculty Council (chairs of the Committees on Graduate Studies), the Graduate Executive Committee (chairs of basic science departments), the University Executive Committee (president, deans and vice presidents of UTHSCSA) and the UT Board of Regents.

## **PROCEDURE FOR DISSERTATION COPYING, BINDING AND MICROFILMING**

Students may continue to have paper copies of their dissertations bound for their personal use, for their committee, and for the department. One ream of 100% cotton bond paper is provided by the Physiology Department. The department will pay for up to 12 copies of each dissertation. A print shop requisition will need to be completed and then the dissertation taken to print shop for copying. Color copies must be made by either the student or by the front office color printer. The print shop advises that the copy of the dissertation be printed on regular paper in order to avoid jams in the machinery. The following copies of the dissertation are required:

- 1 copy for each committee member – regular copy
- 1 copy for the Physiology Library – regular copy
- 1 copy for the student – 100% cotton bond (optional)

The department will pay binding costs for all committee members, the Physiology library copy, and one copy for the student. All extra binding costs (\$14 extra per bound copy) will be charged to the student. Each Ph.D. student must also pay a \$55 microfilm fee online to UMI, payable with credit card. Microfilm charges do not apply for M.S. students. Along with the paperwork for the bindery service, all other dissertation copies should be taken to the Bindery located on the 2nd floor of the Briscoe Library. Each copy should be placed in an individual labeled envelope (i.e. Tom Smith/Briscoe Library). The binding process can take several months.

### **CLEARANCE PROCESS**

Student must complete a clearance form: Graduate Research Assistant clearance form for the Department of Physiology. These forms require the student to turn in the ID card, keys and lab coats as well as check for any outstanding student loans, library charges and parking charges.

### **MISCELLANEOUS**

#### **Travel Support to Graduate Students:**

The Department of Physiology/Physiology Graduate Program will grant travel awards to eligible students to present their research at national scientific conferences. Applications for the competitive awards will be evaluated in two cycles: Fall semester (due September 1st) and Spring semester (due February 1st). One award (up to \$1000) will be granted each cycle, for a total of two awards per year.

Eligibility: To be eligible for a Student Travel Award, you must be:

- 1) a Physiology student, MCIP Track student or non-MCIP Track student working in the lab of a Physiology Primary Faculty member,
- 2) in good academic standing,
- 3) presenting author on a scientific abstract at the meeting for which you are requesting an award.

To apply, complete the Student Travel Award Application form located at <http://physiology.uthscsa.edu/new/teaching/travel.asp> and submit it, along with your current curriculum vitae, to [physiologygrad@uthscsa.edu](mailto:physiologygrad@uthscsa.edu). Your C.V. should include a list of publications, awards, memberships in scientific societies and details of service to the School.

**This award is in honor of Vernon S. Bishop, Ph.D., Chairman of the Department of Physiology 1992 – 2003.**

### **MASTER OF SCIENCE IN PHYSIOLOGY**

Only under special circumstances may a student enter as a M.S. student or petition to change academic tracks from Ph.D. to M.S. In order to petition to change academic tracks, the student must submit a request to the Chair of COGS explaining the necessity to change academic tracks. If the request is approved by COGS, the student's petition is then forwarded to the Dean's Office for approval. See Academic Coordinator for details.

The Department of Physiology offers a program of graduate study for K-12 science teachers that leads to a Master of Science Degree in Physiology. Classes are held in the evening during the school year and require 21 months to complete.

**Required Courses/Course Descriptions (M.S. K-12 Teachers)**

The M.S. Degree Program in Physiology for K-12 teachers requires enrollment in the Fall and Spring semesters of two consecutive school years plus the summer semester between the two school years. Enrollment will be for 6 hours of credit each semester. Completion of 30 credit hours is required for the M.S. Degree.

During the Fall and Spring semesters of each year, students will take courses, which will meet on Tuesdays and Thursdays from 6:00 p.m. to 10:00 p.m. During the summer session between the first and second year, students will engage in research full-time in the laboratories of their faculty mentors. This research activity will include selecting an M.S. thesis project. If necessary, the M.S. Degree research project and thesis may be completed in the second summer after enrollment.

**Year One - Fall Semester**

*PHYL 5021 Cell Structure and Function (4 Credit Hours)*

The focus of this course is physiology of the cell. Areas covered include cell structures and their biological roles; characteristics, roles, synthesis, and utilization of proteins, carbohydrates, and lipids in the cell; mechanisms of exchange of materials between cell and environment; and mechanisms of excitability in nerve and muscle cells.

*PHYL 5011 Discovery of Physiological Principles I (2 Credit Hours)*

This course includes discussions on historic discoveries and ethical research issues in physiology, development of laboratory skills, analysis of laboratory demonstrations, and participation in laboratory experiments in the areas covered in Cell Structure and Function.

**Year One - Spring Semester**

*PHYL 5024 Organ System Physiology I (4 Credit Hours)*

A study of the mechanisms that produce and control the functions of the musculoskeletal, nervous, cardiovascular, and respiratory systems.

*PHYL 5014 Discovery of Physiological Principles II (2 Credit Hours)*

This course includes discussions on historic discoveries and ethical research issues in physiology, development of laboratory skills, analysis of laboratory demonstrations, and participation in laboratory experiments in the areas covered in Organ System Physiology I.

**Year One - Summer Semester**

*PHYL 6097 Laboratory Research (6 Credit Hours)*

Students participate full-time in laboratory research of a faculty mentor. This research will form the basis of the thesis for the M.S. Degree.

**Year Two - Fall Semester**

*PHYL 5025 Organ System Physiology II (4 Credit Hours)*

A study of the mechanisms that produce and control the functions of the renal, gastrointestinal, endocrine, and reproductive systems.

*PHYL 5017 Discovery of Physiological Principles III (2 Credit Hours)*

This course consists of laboratory demonstrations and experiments in areas covered in Organ Systems Physiology II and acquisition of skills for analyzing and communicating the results of laboratory research.

**Year Two - Spring Semester**

*PHYL 5026 Physiology in Everyday Life & Medicine (3 Credit Hours)*

This course will focus on the physiological principles pertinent to selected issues related to lifestyle, well-being, and disease. Examples of discussion topics include body temperature regulation, exercise, aging, diet, high blood pressure, and diabetes.

*PHYL 6098 Thesis (3 Credit Hours)*

Under supervision of the Faculty Advisor and Supervising Committee, the student writes the M.S. thesis and presents the oral defense.

**Year Two - Summer Semester** (if necessary)

If necessary, the student will finish the laboratory research and/or the M.S. thesis.

Qualifying Examination

Not required.

Admission to Candidacy

Recommendation by the COGS that the student be admitted to candidacy requires the following:

1. Satisfactory completion of all required courses;
2. Cumulative GPA of at least 3.0 in all coursework undertaken since matriculation into the program.
3. Report by the students supervising professor that the student has clearly evidenced the potential for productive and independent investigation.
4. Approval of the COGS for admission to candidacy. Form 31 - "Petition for Admission to Candidacy for the Degree of Master of Science" to be submitted to the Dean's Office.  
(*The most recent version of all required forms can be found at*  
<http://gsbs.uthscsa.edu/main/currentstudents/currentstudentresources>.)
5. Approval of Dean's Office.

Supervising Committee

The student will prepare a proposal for the thesis research and submit it to the supervising professor. Instructions for preparation and submission of thesis research should be obtained in the Deans' Office before writing begins. Other faculty members with expertise in the area of the research proposal will be selected by the student and supervising professor to review and modify the proposal. When the Supervising Professor is satisfied, the proposal is submitted to the COGS for approval and presented as a seminar in the Department of Physiology seminar program. Upon approval by the COGS, Form 31 "Petition for Admission to Candidacy" must be completed and turned into the Dean's Office for approval.

The student and faculty will then recommend to the COGS a Supervising Committee composed of:

- (a) the supervising professor, designated as Supervising Professor and Chair of the Supervising Committee;
- (b) two (or more) members of the Physiology graduate program faculty;
- (c) one (or more) faculty from outside the program but from within the institution;

Form 42 – "Composition of Supervising Committee" form must be completed, signed by supervising committee, signed by the Chair of COGS and then submitted along with a computer file of your proposal to the Dean's Office for approval.

### Registration for Thesis

Students approved for the M.S. degree may register for the thesis course (PHYL 6098) only after the following actions have been taken:

1. Approval of admission to candidacy for the M.S. degree by the Dean
2. Approval of the thesis research proposal by the COGS
3. Appointment of a Supervising Committee for the thesis research by the COGS

A candidate for the M.S. degree must register for the thesis course for a least one semester before defending.

### Guidelines for Planning for Graduation

Specific key dates for planning your graduation are available in the Graduate Dean's Office. Below are the general guidelines:

- 3 weeks prior to the end of the semester: Submit Form 40: "Request for Final Defense and Oral Examination" with original signatures, and 3 copies of your abstract and vita to the Graduate Dean's Office. You must obtain original signature from your outside committee member. No faxes will be accepted.
- 2 weeks prior to the end of the semester: Schedule your defense prior to this date to allow time for revision to be made to your dissertation/thesis.
- 1 week prior to the end of the semester: Submit the final version of your thesis on 100% cotton bond, the signed Form 41: "Report on Final Oral" and the signed approval page to the Graduate Dean's Office for approval by the Dean.

A completed "Application for Degree" and "Diploma Name Request" must be filed during the semester in which the candidate expects to graduate. Forms are available in the Dean's Office or the Registrar's Office.

APPENDICES

**APPENDIX I – Committee Memberships**

**Membership of the Committee on Graduate Studies in Physiology**

Shane Rea, Ph.D. - Chair  
Veronica Galvan, Ph.D.  
James Lechleiter, Ph.D.  
Gregory Macleod, Ph.D.  
Michael Beckstead, Ph.D.  
Robert Brenner, Ph.D.  
Luke Whitmire, Student representative  
John Johnson Ph.D. – Interim Department Chair

**Membership of the Physiology Test Committee**

Lyn Daws, Ph.D - Chair  
Peter Hornsby, Ph.D.  
Jun Hee Kim, Ph.D.  
James Nelson, Ph.D.

**Molecular, Cellular and Integrative Physiology (MCIP) Track**

Track Co-leaders:  
Robert Brenner, Ph.D. and Mark Shapiro, Ph.D.

APPENDIX II - Semi-Annual Reports

**Semi-Annual Progress Report-Ph.D. Graduate Student**

**Graduate Student Supervising Committee Semi-Annual Progress Report**

Second-Year students without a committee must submit the Graduate Student Semi-Annual Progress Report. Students with a committee must submit BOTH forms: the Graduate Student Semi-Annual Progress Report and the Supervising Committee Progress report.

To be submitted to Academic Coordinator semi-annually by January 31 and July 31

Describe your research activities of the last six months. Include any hypotheses, methodology, results, references, discussion, publications/manuscripts that you believe are relevant. You may attach figures to this report if desired.

Please list your specific aims for the next six months:

Do you believe that you are on target, i.e., where you should be at this stage in your graduate school experience? (Circle one) Yes No

Supervising Professor's comments on student's progression:

Supervising Professor Signature: \_\_\_\_\_ Date

\_\_\_\_\_

If applicable, are you satisfied with the role your committee has played in the past six months?

(Circle one) Yes No

If not, please comment:

Graduate Student Signature: \_\_\_\_\_

Date \_\_\_\_\_

**Supervising Committee Semi-Annual Progress Report**

To be submitted to Academic Coordinator semi-annually, following committee meetings.

Name of Graduate Student: \_\_\_\_\_

Date of Committee Meeting: \_\_\_\_\_

Please answer each question and provide comments as you see fit.

Was the student's presentation well-prepared? Yes No

Did the student's presentation reflect progress? Yes No

Does the student have a clear plan for the next six months? Yes No

Does the student have a target date for graduation? Yes No

Comments and evidence of student's progression:

Signatures of committee members:

\_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_ Date: \_\_\_\_\_

I agree with the above assessment of my performance of the past six months:

Student Signature \_\_\_\_\_ Date: \_\_\_\_\_