MASTER OF SCIENCE

GRADUATE PROGRAM

IN

PHYSIOLOGY

AT

THE UNIVERSITY OF LOUISVILLE

HEALTH SCIENCES CENTER

June 2018

GENERAL PROCEDURES AND REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN THE DEPARTMENT OF PHYSIOLOGY

I. PROGRAM OVERVIEW AND OBJECTIVES

The Department of Physiology is located in the Health Sciences Center of the University of Louisville which provides our graduate students with an active and intellectually stimulating environment. Our Graduate Program offers a Master of Science Degree to provide several career options. The **Pre-HealthCare track** is for students who wish to enhance their credentials for admission to and performance in professional healthcare programs. The **Research track** is to: 1) develop competence in directed research for advanced technical positions in industry, government, and university medical research laboratories; 2) prepare students with a good general knowledge of human physiology to enable them to communicate physiological concepts to future students; and 3) explore the possibility of a future career as an independent scientist in medically-related research.

The typical Master of Science (M.S.) Graduate Program consists of thirty (30) semester hours typically over a twelve-month (3 semesters) period to include the following: 18 credit hours of physiology and biochemistry and at least 12 credit hours of electives.

II. ADMISSION

A. APPLICATION PROCEDURES

The University of Louisville School of Interdisciplinary and Graduate Studies (SIGS) catalog gives a general description of admission procedures. Application information can be found on the SIGS website (www.graduate.louisville.edu). The following application items must be submitted to the Graduate School Admissions Office at the University of Louisville.

1. One official transcript of the applicant's previous work for each college or university that has been previously attended.
2. At least two letters of recommendation from people who are well acquainted with the applicant's previous academic work.
3. Applicants must forward scores from the Analytical, Verbal and Quantitative portions of the Graduate Record Examination (GRE). Professional school admission tests may be used instead of the GRE.
4. TOEFL Examination scores for foreign students from non-English speaking countries.
5. A non-returnable application fee to the University of Louisville.
6. Applicants must state in a letter to the Department but submitted to the SIGS (referred to as the Personal Statement in the application materials), why they desire a M.S. degree in this Department of Physiology.

B. ADMISSION REQUIREMENTS

1. A cumulative undergraduate grade point average that is usually 2.80 or higher on a scale of 4.00 (A=4, B=3, etc.)
2. A Graduate Record Examination Score which usually averages at the 40th percentile or higher in the verbal, quantitative and analytical sections.
3. Satisfactory MCAT, DAT, OAT or similar test scores may also be accepted *in lieu* of the GRE
   In the case of a foreign applicant from a non-English speaking country, the applicant must achieve a TOEFL Examination score of 550 (paper) or 213 (computerized).

C. PROCEDURES FOR DETERMINING ADMISSIONS

1. Two committees will manage student admission into the Department Graduate Programs. The Graduate Program Executive Committee (GPEC) and the Graduate Admission Committee (GAC). Refer to Appendix A for details of composition and function.

2. The GPEC will determine if an applicant should be voted on by the entire admissions committee; interviewed prior to a determination of a vote; or not eligible for the program.

III. REQUIREMENTS FOR THE MASTER'S DEGREE

A. ADVISOR SELECTION

1. FIRST SEMESTER TEMPORARY ADVISOR
   The Director of Graduate Studies will meet with the new student to discuss the academic and research interests. The Director of Graduate Studies will serve as a Temporary Advisor until a Permanent Advisor is selected.

2. During the first semester of their graduate study, **Research track** students visit research laboratories in which they have an interest. First-year students must select a principal advisor. The selection process involves approval by the student, the Principal Advisor, the Director of Graduate Studies, and the Department Chair.

3. The Director of Graduate Studies will serve as the Academic Advisor for students in the **Pre-HealthCare track**.

B. MINIMUM PROGRAM REQUIREMENTS

At least 30 semester hours beyond the Baccalaureate Degree are required for the degree of Master of Science. A maximum of 6 semester credit hours (CH) may be credited from post-baccalaureate work in other professional or graduate degree programs.

C. MINIMUM COURSE REQUIREMENTS

The typical M.S. Program must include (if not completed prior to admission to the Department) the following courses taken on a grade basis:

Fall semester:

PHZB 605 or equivalent (required)	5 CH
BIOC 645 or equivalent (required)	4 CH
Electives	3 CH

Spring semester:

PHZB 606 or equivalent (required)	5 CH
BIOC 647 or equivalent (required)	4 CH
Electives	3 CH

Summer:

Electives	6 CH

All electives must be graduate levels courses. See Appendix B for suggested electives.

D. ACADEMIC PERFORMANCE

A student must have at least a 3.0 accumulated GPA to be graduated with a degree of Master of Science in Physiology. In general, a student with a GPA that is less than 3.0 at the end of the second semester will require a 2/3 majority vote of the Departmental faculty to continue in the Program. A student may not be graduated with more than 6 CH of "C" grades in their required courses.

E. FINAL EXAMINATION

The **Research track** M.S. student will take a Final Examination during the last semester of the M.S. Program. The Final Examination shall consist of an oral presentation. This exam may take the form of a presentation of the research experience or a detailed review of a selected topic.

The **Pre-HealthCare track** M.S. student will give a final presentation as part of the Clinical Physiology course during their last semester. The topic will be determined by the student and the Course Director.

A positive recommendation for the Master of Science Degree shall require a majority vote of the Final Examination Committee (consisting of at least the Principal Advisor who will serve as Chair and two additional members of the Graduate Faculty, one of whom is from outside the Department).

The Committee must have been approved by Director of Graduate Studies, the Department Chair, and the Dean of the School of Medicine (or his/her designee) prior to the Final Examination. This recommendation shall be made at least one week before graduation. In the event of an unfavorable vote of the Final Examination Committee, the student may be considered for re-examination only by a recommendation of a 2/3 majority of the Departmental faculty.

APPENDIX A

ADMISSION

Two committees will control student admission into the Department Graduate Programs: The Graduate Program Executive Committee (GPEC) and the Graduate Admission Committee (GAC). The GPEC will make recommendations to the GAC concerning applicants based upon a dossier of information obtained from the Admission Office of the School of Interdisciplinary and Graduate Studies (SIGS). The GAC will conduct student interviews when recommended and will vote on admission as representatives of the entire faculty of the Department.

A. Structure of Admission Committees:

The GPEC will consist of the Director of Graduate Admissions, the Director of Graduate Studies, and one other Departmental faculty member, all of whom are appointed by the Departmental Chair for staggered five-year terms.

The GAC will be composed of three tenured or tenure-track Department faculty members and members of GPEC, for a total membership of six. The full-time faculty of the Department will elect the three faculty representatives to GAC for staggered three-year terms.

B. Functions of the Admission Committees:

The GPEC evaluates all requests for admission into the Program. The Director of Admissions will create a dossier of information on applicants that complete the application process. This dossier will be derived from PeopleSoft and OnBase databases. A completed applicant dossier (i.e. all application material indicated in section 1.A., “Application Procedures”) will be submitted to GPEC for evaluation. The GPEC will determine if the student’s qualifications warrant a vote without further information or if a departmental interview is needed to adequately assess an applicant. A simple majority by GPEC will be used to determine if an applicant is: voted on by GAC; interviewed by GAC; or unqualified for the program. Interviews will be arranged by the Director of Graduate Admissions. The applicant will be interviewed by:

- At least one member of the GPEC
- The Department Chair or the Chair’s designated representative
- Two to three members of the GAC.

If the applicant cannot come for an interview, then consideration of the application will proceed without the interview, or in some cases, by telephone interview.

The Director of Graduate Admissions will create a summary of the applicants academic background and interview results (i.e., the GPEC Report). This document and the complete dossier will serve as basis for admission or denial.

The GAC considers the GPEC Report and complete dossier and votes on admissibility of each applicant. Student admission will require a simple majority recommendation from GAC. The recommendation of GAC is forwarded to the Director of Graduate Admissions. Completion of the admission process is accomplished by submission of a Referral Form to SIGS and delivery of the GPEC Report and complete dossier on admitted students to the Departmental Office. The Referral Form will initiate an acceptance or denial letter to the student. The GPEC Report and the complete dossier becomes the Department File on the admitted student and are transferred to the Director of Graduate Studies.

When an applicant is accepted into the Department Graduate Program, The Department Chair will send a letter of acceptance. The prospective student must provide a letter indicating their acceptance of admission to the Department Graduate Program.

Course Descriptions

REQUIRED COURSES:

Fall Semester

Systemic Physiology I (5 cr.)

Course #: PHZB-605

Offered: Monday, Wednesday and Friday, 1:00 to 3:00 PM

Description: Systemic Physiology I is the first of two human physiology courses that are offered the first year of the graduate programs in the Department of Physiology at the School of Medicine. This course contains four hours of lecture and two hours of recitation/application per week.

Advanced Biochemistry I (4 cr.)

Course #: BIOC-645

Offered: Monday 3:00 to 4:00 PM, Tuesday & Thursday 9:00 to 10:15 AM, and Friday, 9:00 to 9:50 AM

Description: Chemistry of amino acids, peptides, proteins, nucleotides and nucleic acids; methods of analysis and laboratory synthesis; nucleotides; RNA, DNA and protein biosynthesis. Lectures concurrent with CHEM-545; one added lecture hour each week covers advanced topics.

Spring Semester

Systemic Physiology II (5 cr.)

Course #: PHZB-606

Offered: Monday, Wednesday and Friday, 1:00 to 3:00 PM

Description: Systemic Physiology II is the second of two human physiology courses that are offered the first year of the graduate programs in the Department of Physiology at the School of Medicine. This course contains four hours of lecture and two hours of recitation/application per week.

Advanced Biochemistry II (3 cr.)

Course #: BIOC-647 (Prerequisite: BIOC-645)

Offered: Monday 3:00 to 4:00 PM, Tuesday & Thursday 9:00 to 10:15 AM, and Friday, 9:00 to 9:50 AM

Description: Cellular metabolism of carbohydrates, lipids, amino acids and nucleotides; enzyme properties, kinetics, and control mechanisms, ligand binding; biomembrane phenomena. Lectures concurrent with CHEM-547; one added lecture hour each week covers advanced topics.

ELECTIVE COURSES:

Fall Semester

Stem Cell Biology

Course #: . PHZB-604

Offered: Tuesday, 1:00 to 4:00

Description: The course will focus on the biology of stem cells and their role in health and disease. Emphasis will be placed on development, carcinogenesis and tissue engineering.

Principles of Oral Presentations: Self, Science, and Interview Skills (3 cr.)

Course #: PHZB-607

Offered: Tuesday and Thursday, 1:00 to 2:30

Description: The plan for Oral Presentations will be centered on four steps: Plan, Produce, Practice and Present. This course will include: an instructive component, a "how to" leverage and/or optimize PowerPoint (or other presentation software), standing up and presenting in a room, best practices for presentations in the virtual world and how to strengthen interview skills.

Seminars in Physiology (1 cr.)

Course #: PHZB-617

Offered: Both Fall and Spring Semesters; Tuesday, 11:45 AM to 12:45 PM

Description: This course includes the attendance at the weekly seminar series with a submitted, brief, written, critique of the science presented by the speaker.

Research in Physiology (1 - 3 cr.)

Course #: PHZB-619

Offered: To Be Determined

Description: There is a limited enrollment in this course for those who wish to complete physiologically relevant research with one of our faculty and/or associates. The number of credits will depend upon the level of commitment by the student in agreement with a faculty mentor and the Director of Graduate Education for Physiology.

Molecular Microbiology (2 cr.)

Course #: MBIO-601

Offered: Tuesday and Thursday, 3:00 to 4:00

Description: The course is an introduction to microbiology, focusing on the molecular make-up, function, and diversity of microorganisms, primarily bacteria. The pathogenic potential of bacteria will also be explored.

Spring Semester

Biomedical Applications of Physiology of the Eye (3 cr.)

Course #: PHZB-630

Offered: Tuesday 3:30 to 6:15

Description: Overall, this course offers a solid background in physiology, pathophysiology, measurement methods, and biomedical aspects of the eye which will well-prepare a student for pursuit of a career in professions related to eye health.

Principles of Oral Presentations: Self, Science, and Interview Skills (3 cr.)

Course #: PHZB-607

Offered: Tuesday and Thursday 1:00 to 2:30

Description: The plan for Oral Presentations will be centered on four steps: Plan, Produce, Practice and Present. This course will include: an instructive component, a “how to” leverage and/or optimize PowerPoint (or other presentation software), standing up and presenting in a room, best practices for presentations in the virtual world and how to strengthen interview skills.

Advanced Cardiovascular Physiology (3 cr.)

Course #: PHZB-611 (Prerequisite: PHZB-605)

Offered: Tuesday, 1:00 to 4:00 PM

Description: PHY 611 utilizes lectures on the physiological and biochemical processes in the heart, blood vessels and blood elements to provide more detailed mechanisms from molecular to systematic levels and normal to pathological states.

Seminars in Physiology (1 cr.)

Course #: PHZB-617

Offered: Both Fall and Spring Semesters; Tuesday, 11:45 AM to 12:45 PM

Description: This course includes the attendance at the weekly seminar series with a submitted, brief, written, critique of the science presented by the speaker.

Research in Physiology (1 - 3 cr.)

Course #: PHZB-619

Offered: To Be Determined

Description: There is a limited enrollment in this course for those who wish to complete physiologically relevant research with one of our faculty and/or associates. The number of credits will depend upon the level of commitment by the student in agreement with a faculty mentor and the Director of Graduate Education for Physiology.

Cell Biology (3 cr.)

Course#: BIOC 667

Offered: Mon and Wed, 10:-11:30

Cancer Biology (4 cr.)

Course # BIOC 675

Offered: Tues and Thurs, 1:00-3:00

Summer Semester

Clinical Physiology (6 cr.)

Course #: PHZB-615 (Prerequisites: PHZB-605 and PHZB-606)

Offered: Monday, Wednesday and Friday 9:00 to 11:00 AM

Description: This is a course that uses clinical situations to examine and reinforce mechanisms important to understanding systemic physiology. There are six areas covered:

1) electrical functioning of the heart
2) blood pressure and circulatory control mechanisms
3) ventilation and perfusion of the lungs
4) gastrointestinal blood flow and acid production
5) blood flow and oxygen utilization by the heart
6) control of the many endocrine functions

This course utilizes a combination of faculty-lead teaching techniques that include: team based learning (TBL), problem based learning (PBL), and in-class exercises. All course materials have been prepared by the supervising faculty and will be available to students online as needed.

Research in Physiology (1 - 6 cr.)

Course #: PHZB-619

Offered: To Be Determined

Description: There is a limited enrollment in this course for those who wish to complete physiologically relevant research with one of our faculty and/or associates. The number of credits will depend upon the level of commitment by the student in agreement with a faculty mentor and the Director of Graduate Education for Physiology.