

**Department of Physiology  
University of Kentucky**

**Graduate Program Handbook**

**Created by Andrew Hernandez**

**Last updated on 8/9/2017 by Ken Campbell**

## List of changes

- 1/5/2017 Created active hyperlinks.
- 1/22/2017 Improved instructions for MD/PhD students, general updates and improvements.
- 1/30/2017 Updated application information for MD/PhD students
- 4/20/2017 Clarified information on summer qualifying exams  
Updated links to Physiology-specific forms
- 6/6/2017 Clarified timeline for qualifying exam  
Suggested an initial meeting with the advisory committee
- 6/21/2017 Clarified requirements for written proposal for qualifying exam  
Clarified procedures for presenting students to the department
- 6/29/2017 Clarified that students need to accumulate 18 credit hours before sitting their Qualifying Exam.  
Clarified that MD/PhD students need 18 credits before sitting their Qualifying Exam
- 8/9/2017 Clarified that UK requires all students to accumulate a total of 36 graduate credits before they sit their Qualifying Exam, with 18 of these hours typically acquired from the PGY program.

## General Program Information

The Graduate Program of the Department of Physiology is a Ph.D. program designed to educate and train students to be competent research scientists and teachers of physiology. The specific objectives of the program are to provide students with:

- *The capacity to carry out independent research in an area of physiology. This includes the ability to: conceive new and significant hypotheses; investigate the literature with respect to these hypotheses; design studies/experiments to test hypotheses; develop a critical approach to experimental design; and communicate the results of this research in both written and oral formats;*
- *Opportunities for training in the teaching of physiology. This may include any of a broad spectrum of experiences and may involve the use of a wide range of educational approaches.*

In order to foster these objectives the department is committed to providing each student with:

- *An environment that promotes independent development and habits of life-long scholarship.*
- *A broad base of knowledge of the principles of molecular, cellular and organ-system physiology. The student should be able to comprehend and use information from different areas of physiology and have the ability to analyze physiological problems quantitatively.*

To fulfill these objectives, the graduate program combines individualized training with formal coursework, independent research activities, interaction with scholars at the tutorial level, and independent reading. A high premium is placed on individual responsibility of the student to work toward the above objectives.

## Entry routes to the Physiology PhD program

Most students who seek a PhD from the Physiology program are admitted through the [Integrated Biomedical Sciences Program \(IBS\)](#), managed by the [Office of Biomedical Education \(OBE\)](#). This program is described in more detail starting on page 3.

In conjunction with the College of Medicine, the Department of Physiology will also consider for admission qualified students wishing to pursue a [combined MD/PhD degree](#). Special instructions for these students are described starting on page 14.

The Department will also consider DMD/PhD students who wish to combine PhD and dental training. This is a less common route for students. Please contact the DGS to discuss this option.

Under special circumstances, advanced students may apply directly to the Physiology graduate program. Again, this is less common. Please contact the DGS to discuss this option.

# Integrated Biomedical Sciences Program

## First Year

### REQUIREMENTS FOR ADMISSION

Most PhD students in the University of Kentucky College of Medicine are admitted through the common Integrated Biomedical Sciences Program. All students spend their first year completing an undifferentiated core curriculum that provides training in cellular and molecular concepts and helps them to develop interdisciplinary approaches that are essential for innovative research.

Students complete at least 4 rotations with potential mentors drawn from basic science departments. Students who select a full or joint member of the Physiology Faculty as a primary mentor and who successfully complete the Integrated Biomedical Sciences Program curriculum are eligible to apply to the Physiology Graduate Program.

Note that students are not formally accepted into the Physiology program until their request is approved by their mentor, and by the Physiology faculty.

The faculty vote is normally taken at a normal monthly faculty meeting after the primary mentor has presented the student for discussion. There is no set format for this presentation but most faculty choose to describe their student's background, accomplishments and CV in 2 to 3 minutes. Other faculty are then invited to contribute to the conversation. The DGS then calls for a vote. In most cases, the process takes no more than 5 minutes.

### STUDENT STIPENDS AND TUITION

Students are provided with stipends and tuition through their fifth year, subject to periodic evaluation as explained below. For the academic year 2016-17, students are provided with the stipend of \$25,000.

## CURRICULUM

Students take a common IBS curriculum, consisting of core classes (listed in table below), and do laboratory rotations and seminar programs in their areas of interest. With the prior approval of the IBS oversight committee, students with exceptional training have the opportunity to opt out of one or more of the lecture classes.

<u>Fall Semester</u>	<u>Spring Semester</u>
IBS 601	IBS 603
IBS 602	IBS 606
IBS 607	IBS 607
IBS 609	IBS 608
IBS 610	IBS 609
IBS 611	TOX 600

## Second Year

### COURSEWORK

Full-time graduate students are expected to carry at least 9 credit hours for fall or spring semester prior to qualifying exam.

Students must demonstrate sufficient physiological knowledge to pass a comprehensive exam that consists of both the written and oral examinations given in PGY602. If students fail to perform at a B level or better, they may be given one opportunity to retake the oral portion of the exam. The grade on the retake will not be considered for PGY 602 grading. To continue in the Department of Physiology Graduate Program, students must meet the B-or-better performance criteria as assessed by the faculty present/participating in the 602 exam.

- *PGY 774 Graduate Seminar* (1 credit) is required of all second and third year PGY graduate students. Senior PGY students are encouraged to attend class when the seminar topic is within their area of specialty. Each third year student is required to present a departmental seminar.
- *PGY 502 Principles of Systems, Cellular and Molecular Physiology* (5 credits): Obtaining a grade of B or better is required of all Physiology graduate students. This is taken in fall of the second year.
- *PGY602 Readings in Systems, Cellular and Molecular Physiology* (3 credits): This companion course to PGY 502 is also taken in the fall of the second year. PGY 602 focuses on application and utilization of physiological concepts presented in PGY 502. Written exams throughout the

course and an oral exam at the end of the course will be used to assess this ability. Grading for PGY 602 is based primarily on the outcome of the written and oral examinations. Must obtain a grade of “B” or better.

- *Additional coursework:* Each student's Advisory Committee is charged with determining whether additional coursework is needed to tailor a student's training to their needs. A list of suggested courses is:
  - STA 570 or STA 580 Statistics
  - PGY 601 Mammalian Endocrinology
  - PGY 604 Advanced Cardiovascular Physiology
  - PGY 605 Principles of Neurobiology
  - PGY 606 Advanced Neurophysiology
  - PGY 608 Advanced Renal Physiology
  - PGY 609 Advanced Respiratory Physiology
  - PGY 617 Physiological Genomics
  - PGY 618 Molecular Neurobiology
  - PGY 638 Developmental Neurobiology
  - PGY 660 Biology of Reproduction
- *Scientific ethics course:* If students have not done so as part of the IBS program, students are strongly encouraged to take a scientific ethics course such as TOX 600 Ethics in Scientific Research.
- *Seminar Presentation Course:* This informal course is designed to help students to effectively present seminars. The students are expected to participate in this informal course for 3 semesters (second year and the fall semester of the third year).
- *Student Chalk-talk:* This is a student-run program. All graduate students are encouraged to participate in this program.
- *Experimental Design Workshop:* typically offered to students in the summer after joining the program. All incoming Physiology PhD students are expected to attend the workshop.

## ADVISORY COMMITTEE

Upon entering the Physiology Graduate Program by selecting the mentor in Physiology, students are encouraged to select their Advisory Committee. This can be done at any time, and is usually done during the first year after entering the program and is formalized online through the [Graduate School](#). The Advisory Committee is especially charged with advising the student on specialized training that will allow them to become expert within their chosen area of physiology. This training can be obtained through advanced courses, tutorials, laboratory research, journal clubs, lab meetings, and other types of individualized instruction.

The Advisory Committee must consider the individual needs of each student, advise accordingly, and be willing to assist in this training. Thus, membership is tailored as much as possible to match the student's interest and needs.

The Committee consists of no fewer than four Faculty; the student must check the Graduate Faculty status of individual committee members before finalizing their Advisory Committee.

- The Dissertation Director, generally as Committee Chair (also known as Advisor/Mentor)
- Two or more additional members of the Department of Physiology
- At least one member from a supporting area outside the department

### **Committee Member Rules**

- At least three members must be full members of the Graduate Faculty.
- The outside member must be a member of the Graduate Faculty.
- The Dissertation Director must be a full-time faculty member of the Department of Physiology and should be a full member of the Graduate Faculty.
- In cases where the faculty mentor is a joint appointee of the Department, a full-time, regular Department of Physiology faculty member must be appointed to act as Co-Director. The Co-director shares full responsibility for oversight of all aspects of the student's progress.
- In the event a Dissertation Director is without tenure or without full Graduate Faculty status, a Co-Director (tenured, Full Graduate Faculty) will be designated.

The Advisory Committee should meet at least once every 6 months. The meetings must include discussion on the student's progress report, the student's goals for the next period, and the committee's evaluation of the student's performance. After the meeting, the student and mentor must provide the "**Committee Meeting Minutes**" of each meeting signed by all participants to the Director of Graduate Studies.

Students should consider scheduling an initial meeting with their Advisory Committee as soon as it is formed. The student can use this meeting to introduce him/her-self to the committee and to receive advice about specialized training / academic courses that may be useful and/or required during the project.

## QUALIFYING EXAM

### Overview

The purpose of the Qualifying Exam is to test whether the student can demonstrate a highly advanced understanding of their chosen field, and has the ability to make use of this knowledge to formulate a novel hypothesis and a logical experimental design to investigate this hypothesis. Preliminary data are encouraged, but not required.

The University of Kentucky requires that graduate students accumulate 36 credit hours before they sit their qualifying exam. IBS students take 18 credits during the first year. MD/PhD students are allowed to transfer 18 credits from their first two years of Medical School. The end result is that all PGY students need to acquire 18 credit hours from the Physiology program to be eligible for the exam.

The registration guidelines provided at

<http://physiology.med.uky.edu/physiology-graduate-program-guidelines>

explain how students can meet these requirements.

### Composition and timeline

- Students write abstracts (up to 500 words) for three novel projects that are distinct from their mentor's written proposals. Each abstract should summarize the entire project. For example, the student may wish to consider formatting the abstract to highlight the rationale, significance, hypothesis, and specific aims for of the project.
- Students schedule a committee meeting and send the abstracts to each member of the committee at least 1 week before the meeting.
- At the committee meeting, the student presents each abstract in a brief oral presentation. The advisory committee then picks an abstract for the student to develop into a full proposal.
- The student then has up to 4 weeks to develop a grant proposal based on the selected project. All students should use the page limits and formatting requirements for an NIH F31 award. See <https://researchtraining.nih.gov/programs/fellowships> for the current requirements.
- The student submits the proposal to the advisory committee, allowing between 1 and 2 weeks for the Committee to review the document prior to the qualifying exam. Thus the total time from proposal selection to qualifying exam is no more than 6 weeks.

## Scheduling

The exam is typically administered soon after the candidate's first spring semester in Physiology (second spring semester at UK for PhD students, first spring semester of PhD phase for MD/PhD students) and no later than the 6<sup>th</sup> week of the fall semester. Exceptions to this rule may be made only after discussion with the DGS.

Students should consult with their primary advisor and the Advisory Committee before scheduling the exam.

## Additional points

- All members of the committee must be present for the exam.
- The exam must be administered during a period in which class is in session. Note that UK has two summer sessions so there only a few intervals when you will not be able to schedule your exam. You can check the dates of the summer sessions via the main UK website.
- To schedule the exam, complete the “**Qualifying Exam Request**” through the **Graduate School** web page at least two weeks before the actual exam date.
- The graduate school will send a card to the DGS and Mentor, which needs to be available for all members of the committee to sign at the time of the exam. **DO NOT PROCEED WITH AN ORAL EXAM WITHOUT THIS CARD!**
- After the exam, the card that has been signed by all members of the committee is to be presented to the DGS or the DGS staff for DGS signature.

## Subsequent Years

### REGISTRATION

Students must register for two credit hours of PGY767 and this ensures full-time status for the student. Students may register for additional classes that are of interest or relevance, in consultation with their advisor or dissertation committee. The students can begin PGY767 the semester of their qualifying exam. Second and third year students also register for PGY774.

Students register for summer research hours when they intend to defend their dissertation in the summer term and only after consulting with the Department of Physiology Director of Graduate Studies.

### COMMUNICATION SKILLS AND DISSERTATION PROPOSAL

The development of good communication skills is an important part of graduate education. These skills are improved through a wide range of activities including: seminar courses; diverse teaching experiences; presentations at local, regional and national meetings; writing of manuscripts, research proposals, and grants; journal clubs; and the final dissertation. Students are strongly encouraged to participate in all activities deemed appropriate by their advisory committee.

During the third year each student must write a brief dissertation proposal consisting of Specific Aims, Background, Preliminary Data (if any), and Experimental Design. This should be 5 -10 pages in length. The advisory committee may agree to accept the Qualifying Exam proposal as the dissertation proposal. Subsequent to approval by the Advisory Committee, it is recommended that this dissertation proposal be presented as part of the Departmental Seminar Series; each third year student is required to present a Departmental seminar, typically during the spring semester of their third year. In subsequent years, students may present an annual seminar in the departmental setting at the discretion of the student and their advisor.

### TEACHING EXPERIENCE

An important part of graduate education includes student participation in the teaching program of the Department. Teaching opportunities include lectures, discussion groups, laboratory sessions, and lab demonstrations. Brief blocks of lectures (1-2 weeks) in courses such as PGY 206/207, or leading discussion sessions in physiology courses provide excellent supervised learning experiences. Course Directors will serve as mentors and provide assistance and feedback for these learning opportunities. The Director of Graduate Studies, in conjunction with the Teaching Director and course directors, coordinates opportunities for teaching with the student and their

advisory committee. Students who anticipate teaching in their future are encouraged to take PGY 615 Seminar in Teaching Medical Science to obtain specific instruction in teaching.

The Department recognizes that teaching commitments outside the Department may be beneficial learning experiences for some students. However, graduate students must receive permission from the Director of Graduate Studies and their mentor prior to every semester they intend to teach outside the department.

To enhance teacher training of our graduate students, the Department of Physiology has established a travel grant that will provide partial support for one physiology graduate student per year to attend a meeting or workshop that focuses on teaching methods and skills with emphasis on health science education. The application process for this award will be announced annually by the Director of Graduate Studies.

## PREPARING FOR THE DISSERTATION

With the help and guidance of the **Dissertation Director** and the **Advisory Committee**, each student must write a dissertation that is the result of original research and adds to or otherwise modifies what was previously known on the subject. The quality and extent of the work must be such that the Advisory Committee regards it as suitable for publication by reputable scientific journals.

### **Dissertation Seminar and Final Examination**

Each student must present a seminar on his or her dissertation research to the Department before the student's final examination can be defended. Responsibility for timing of the dissertation seminar shall rest with the members of the student's Advisory Committee, who will inform the Director of Graduate Studies when the student is ready. The Director of Graduate Studies will then schedule the seminar.

There are three key elements of the final examination: Dissertation writing, Dissertation seminar, and Final Examination. Several forms are required along the road toward the final examination. The forms are very short and usually easy to fill out and the DGS will be able to answer any questions. The candidate must give a copy of every form submitted via the Graduate School website to the DGS or DGS staff for the student's file. A complete list of forms can be found [below](#).

### **Application for degree**

This form is available online through the [myUK Portal](#). Deadlines do exist for each semester, please refer to the website ([link here](#)) or ask the DGS as the specific dates change yearly. Usually, the

deadline is in February for a May degree, June for an August degree, and September for a December degree.

### **Final committee meeting**

Once the dissertation research is complete, the candidate should call a meeting of their Advisory Committee. At this meeting, the candidate should outline the contents of the proposed dissertation. Special attention should be paid to demonstrating the scope and quality of the research, the hypothesis being tested, and the conclusions that have been reached. Minutes for the final meeting should reflect the agreement of the student and committee majority to proceed with writing the dissertation. The [Final Exam Recommendation form](#) is to be signed at final committee meeting and submitted to the DGS.

### **Dissertation writing**

With the help and guidance of the Dissertation Director and the Advisory Committee, each student must write a dissertation that is the result of original research and adds to or otherwise modifies what was previously known on the subject. The Dissertation should contain introduction/background, materials and methods, results, and discussion. The written dissertation must follow a format set by the graduate school.

### **Processes required for setting a date for the Final Examination**

Submission of a "[Notification of Intent to Schedule a Final Exam](#)" to the Graduate School must be arranged through the Graduate School at least 8 weeks prior to the date of the Final Examination. At this time, the student may also provide their Dissertation Abstract, which can be used by the Graduate School to help select the Outside Examiner (more on this below).

The Graduate School will send a "[Final Examination Card](#)" to the DGS and Mentor in the same email notifying them of the approved scheduled final exam. This card needs to be available for all members of the committee to sign at the time of the exam. **DO NOT PROCEED WITH AN ORAL EXAM WITHOUT THIS CARD!**

Once the Graduate School has been notified, the Dean of the Graduate School appoints an Outside Examiner. Following the appointment of the Outside Examiner, the final examination date may be set. Again, the final examination date is scheduled through the [Graduate School](#) website. The candidate contacts all members of the **Advisory Committee** and the **Outside Examiner** and schedules a date for the exam. It is recommended to have at least two weeks between the appointment of the Outside Examiner and the Final Examination date.

The Outside Examiner is appointed by the Graduate School Dean without a specific recommendation from the Physiology Department. The Graduate School attempts to appoint someone who has

understanding of and interest in the topic of the dissertation. The role of the outside examiner is to insure that:

- Only qualified candidates receive degrees
- The program standards are adequate
- The exam is administered in a fair and impartial manner

Once the dissertation writing is complete, copies are given to the members of the Advisory Committee and the DGS. This should be done approximately 4 weeks prior to proposed defense date to allow committee members time to assess the overall competence of the document.

Advisory Committee members sign the [Dissertation Approval form](#), which may be obtained from the DGS, indicating that the document sufficiently communicates the work and its impact to allow an oral defense to proceed (approval is meant simply to be a general assessment of the 'defensibility' of the written dissertation; no revisions are to be made at this time).

If the committee deems the dissertation document is not defensible (for example, one or more elements are missing), the student may be required to have additional committee meeting(s) and reschedule the Final Examination. The student should submit the signed [The Dissertation Approval form](#) to the DGS no later than three (3) weeks prior to the Final Examination date.

As soon as the student gets the required signatures on the Dissertation Approval form, the candidate must deliver to the Outside Examiner a complete, approved copy of the dissertation. This should be done at least two weeks in advance of the examination in order to allow sufficient time for the Outside Examiner to read the Dissertation.

## DISSERTATION DEFENSE

### Dissertation Seminar

Each student must present a seminar on their dissertation research to the Department before the student's final examination and thesis defense. Normally, the seminar is held immediately prior to the Final Examination, but it is permissible (with the pre-approval of the Advisory Committee and Outside Examiner) to present the seminar at a date prior to the Final Examination. All members of the Advisory Committee and the Outside Examiner must be able to attend the final seminar.

### Dissertation Examination

At the Final Examination, the candidate is expected to demonstrate a detailed knowledge of the candidate's field of study and to defend the conclusions of the dissertation. At the conclusion of the examination, a simple majority of the committee need to indicate 'pass' to enable the candidate to receive a doctorate. **THE "FINAL EXAMINATION CARD" MUST BE COMPLETED AT THIS TIME.**

## **Dissertation Writing**

The final copy of the dissertation incorporating any revisions required by the examining committee must be approved by the Graduate School within sixty (60) days of the Final Exam or on the last day of the semester for which the degree be awarded (as defined by the Application for a Degree) whichever is earlier. Failure to complete the dissertation approval within 60 days may result in the student's having to be re-examined. The final copy of the dissertation must contain an Approval Sheet signed by the dissertation director and the DGS when it is submitted to the Graduate School. Candidates must provide the PDF of the thesis to the DGS. The submission of an electronic thesis or dissertation is optional. Specific instructions from the Graduate School are available: [electronic dissertation defense process](#).

## **Dissertation Binding**

Upon the final approval of the Graduate School, students are to send a PDF copy of the thesis to the designated administrator within the Department of Physiology. 3-4 copies of the bound dissertation will be ordered and will be distributed as follows:

- 1 copy to the Department
- 1 copy to the mentor
- 1-2 copies to the student

## MD / PhD Students

MD/PhD students follow the department rules and procedures described for IBS students. Additional notes and explanations are provided below.

- MD/PhD students need to apply to the Graduate School for direct admission into the PGY program. Therese Stearns can help MD/PhD students with the details of this process which can be tricky because the PGY program is not listed on the Graduate School website for direct admission.

The Graduate School website asks for 3 letters of recommendation, a personal statement, and a CV to apply to PGY.

As of 1/30/2017, the DGS will accept applications from MD/PhD students with a CV. Formal letters and a personal statement are not required. The Graduate School has advised that students may need to enter 3 'dummy' email address for the recommendation letters in order to proceed with the application.

- MD/PhD students are reminded that they need to get approval from the Physiology faculty before they are formally accepted into the program. The primary mentor will present the student's case at a normal monthly faculty meeting.
- MD/PhD students are not required to take PGY502/602 on the basis that their medical school training covers this material at a suitable depth. MD/PhD students are required to take PGY774 (1 credit each semester, 4 semesters) and to participate in other activities developed for PGY students (e.g. seminar presentation courses, student chalk-talks, etc.).
- MD/PhD students should form an advisory committee as soon as practical after joining the department.
- MD/PhD students must accumulate 18 credit hours in the Physiology Graduate Program before sitting their qualifying exam. Students should discuss how to fulfill this requirement with their primary mentor and the advisory committee.
- MD/PhD students typically sit their qualifying exam at the end of their second semester in the Physiology training program.

# Appendices

## FORMS

Below is the list of forms that must be completed properly progress towards graduation and receiving a degree. Forms that must be submitted to the Department of Physiology DGS can be found on the Physiology Website at [this link](#).

Forms that are submitted to the Graduate School can be done so electronically via the [Doctoral Degree Candidate Forms site](#). The candidate must provide a copy of all Graduate School forms submitted to the Department of Physiology DGS.

Name of Form	When to Submit	Submit to		
		Physiology DGS	The Graduate School	MyUK Portal
Formation Of Advisory Committee	As soon as committee has been formed (ideally, immediately after PGY 502/602)		✓	
Qualifying Examination Request	At least two weeks prior to qualifying exam date		✓	
Qualifying Exam Card *	Directly after examination	✓		
Application For Degree	The semester the candidate intends to graduate			✓
Final Exam Recommendation	Signed during final committee meeting and submitted directly afterwards	✓		
Notification Of Intent	At least eight weeks prior to expected final exam date		✓	
Dissertation Approval	Roughly four weeks prior to examination	✓		
Request For Final Doctoral Examination	At least two prior weeks prior to final exam date		✓	
Final Exam Card *	Directly after examination	✓		
Final Dissertation Approval	Within 60 days following date of defense		✓	

\*These cards are sent to the DGS and Dissertation Director in the same email that approves the request to schedule the qualifying/final exam. **It is crucial that the Dissertation Director brings these cards to the respective exams.** After examination, the card will be filled out and be given the DGS for signature. After the DGS has signed, the card will be scanned and electronic copy will be sent to the Graduate School's designated Degree Certificate Officer for the Department of Physiology. The hard copy will be kept with the Department's student files.

## TERMINATION OF A STUDENT FROM THE GRADUATE PROGRAM

A student can be terminated from the program for any of the reasons listed below:

1. Academic probation (a GPA of less than 3.0) for three enrolled semesters.
2. A grade lower than a B on PGY 502 or PGY 602.
3. Having failed twice the qualifying examination for the doctoral degree.
4. Failure to make progress toward a degree. Upon recommendation of the Director of Graduate Studies or a student's Dissertation Director that a student has evidenced an unwillingness or inability to make progress toward a degree over an extended period, the faculty may dismiss.
5. Misconduct. Procedures outlined in the [Student Code](#) will be adhered to with respect to a charge of misconduct.
6. In addition to the above, all rules and regulations required by the Graduate School of the University of Kentucky will apply.

## THE MASTER OF SCIENCE DEGREE (M.S.)

The department does not grant the Master of Science degree. Students are admitted to the doctoral program with the understanding that their purpose is to complete the doctoral degree requirements. Under special circumstances, however, the department will consider recommending transfer to the Masters Program in Medical Sciences. It is unlikely that the department will recommend a transfer to the masters program prior to the student's completion of the qualifying examination. Completion of the exam implies that the student will have completed some research and should be able to satisfy the requirements for a thesis masters. The department does not provide financial support for students working toward the Master of Science degree.