



The Huck Institutes
OF THE LIFE SCIENCES

Intercollege Graduate
Degree Program in
Integrative and Biomedical
Physiology

2017-2018 Student and Faculty Handbook

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Integrative and Biomedical Physiology Graduate Program General Requirements

Introduction

Integrative and Biomedical Physiology is an intercollege graduate degree program designed to provide students with an integrated series of courses encompassing both the fundamentals of physiology and advanced concepts in a specialized area. The formal curriculum is complemented by research training that emphasizes a comprehensive perspective and understanding, from molecular mechanisms of control to integration at the cellular, tissue and whole organism level. Specific details related to this handbook and other aspects of the program may be located at <http://www.huck.psu.edu/content/graduate-programs/physiology>.

Prerequisite Courses

A mammalian physiology course at the undergraduate level associated with a laboratory experience is desired. In addition, biochemistry and a basic cell and molecular biology course at the undergraduate level are preferred. Deficiencies in chemistry, biological science, mathematics (through a second course in calculus), and physics must be made up early in the student's graduate program.

Seminars

All students, except those enrolled in PHSIO 590, are required to attend at least 8 one-hour technical seminars each Fall and Spring semester until graduation (4 semesters of which must be assigned credit hours). After the 1st year, it is up to each student in consultation with the faculty advisor to determine which seminars are of the most interest and value to his or her professional goals. Students should pay special attention to the Noll Seminar Series. There are also various seminar series in Animal Science, Biochemistry, Cell and Molecular Biology, Molecular and Cellular Integrative Biosciences, Neuroscience, and Nutritional Sciences, which are of particular relevance. By the last week of the semester, students are required to submit to the Graduate Program Chair via the Staff Assistants, a list of the eight seminars attended. For each seminar, the date, title and speaker are to be included.

English Speaking Requirement for International Students

The English Requirement for International students is that prescribed by the Graduate School. Depending on the graduate program, all entering international students, whether or not they hold a Teaching Assistantship, will be required to take the American English Oral Communicative Proficiency Test (AEOCPT) which is administered by the University's Department of Applied Linguistics.

Given at the beginning of fall and spring semesters, international students are required to pre-register for the AEOCPT. The test scores from the AEOCPT are posted on the University's Administrative Information System (AIS) computer. Below is the course of action for the various AEOCPT score ranges.

NR = No Restrictions. This person should be allowed to teach with no restrictions based on ability to communicate in English.

(Penn State AEOCPT Score of 250-300)

WR = Take ESL 118G. This person should not be allowed to teach before completing and receiving a grade of "A" in ESL 118G - "American Oral English for ITA's III."

(Penn State AEOCPT Score of 230-249)

TC = Take ESL 117G. This person should not be allowed to teach before completing and receiving a grade of "A" in both ESL 117G - "American Oral English for ITA's II" and ESL 118G - "American Oral English for ITA's III."

(Penn State AEOCPT Score of 200-229)

SL = Speaking/Listening. This person should enroll in ESL 115G - "American Oral English for ITA's I" and receive a grade of "A" before taking ESL 117G and ESL 118G.

(Penn State AEOCPT Score below 200)

Students, who are required to enroll in ESL courses, must complete the ESL requirement by the end of the second semester of residency. Students who fail to satisfy this requirement may be terminated from the Integrative and Biomedical Physiology program, at the discretion of the Chair (<http://www.bulletins.psu.edu/graduate/appendices/appendix3>).

Safety Training Sessions/Examinations

Within the first semester of residence, all students are required to take/pass chemical waste disposal training sessions offered at the respective campuses, as well as complete SARI training (see below). With the exception of SARI and as noted below, these sessions occur during Fall Orientation of the 1st year. Students must present documentation of successful completion to the Staff Assistant (Terrie Young). Animal or human subjects training will occur during selected rotations and is under the direction of individual supervisors.

Chemical safety trainings will be completed during the Fall Huck Orientation session(s). Radioisotope training is laboratory specific, and at the discretion of individual laboratory directors as needed. All environmental health and safety issue related guidelines can be found at <https://ehs.psu.edu/laboratory-and-research-safety>.

Animal or human training modules can be found at www.research.psu.edu/orp.

Performance Evaluation

All students will be continually evaluated for both academic performance and compliance with program requirements. The evaluations will be performed by the Integrative and Biomedical Physiology Program Chair until completion of the Candidacy Exam, and then afterwards by the Chair of the Thesis Committee, but reviewed by the Program Chair. Students will complete the **Annual Graduate Student Activity Report (GSAR)**, which will originate from the Huck Institutes Graduate Office to be completed in June of each academic year (https://apps.science.psu.edu/grad_activity/). These evaluations are integral parts of the student's professional development and provide a formal mechanism for students and their advisors to broadly review the student's progress and discuss current and future goals. Regular thesis committee meetings are also required after the first year (minimum 2 per year). Continued financial support of each student will be dependent on satisfactory progress as stated in admission offer letters.

Grade Point Average

Credit hours are earned only for the grades A, B, and C. However, all A 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. Only one grade of C is allowable. If a course is repeated, then both grades are used in computing the cumulative grade point average.

Unsatisfactory Scholarship

Students are required to have a minimum grade-point average of 3.0 for the doctoral candidacy examination, admission to the comprehensive examination, thesis defense, and graduation. One or more failing grades, a cumulative grade-point average below 3.0, or failing any of the examinations may be considered evidence of

unsatisfactory scholarship and be grounds for dismissal from the University (see the Appendix III of the Graduate Programs Bulletin (<http://bulletins.psu.edu/graduate/generalinformation/appendix3>)).

Problem Resolution

If problems arise that a student feels are not handled adequately by initial, direct discussion with the advisor or party involved, then the student may meet with the Integrative and Biomedical Physiology Program Chair (Dr. Korzick), who will act to arbitrate further discussions between faculty and students. If the student disagrees with the Committee's advice or decision, or that of the Program Chair, the student should discuss the situation with Dr. Troy Ott, Associate Director of the Huck Institutes (tlo12@psu.edu; 814-441-2657) and/or with the Doctoral Thesis Committee (if post-candidacy). Dr. Ott can assist with arbitration through the leadership of the Huck Institutes of the Life Sciences. Resources are also available through the Graduate School. (<http://bulletins.psu.edu/graduate/appendices/appendix2>).

Assistantships and Student Status

Students with teaching or research graduate assistantships must be registered as full time students to maintain stipend eligibility. Full time status is considered either a minimum of nine credits each fall and spring semester (pre-comprehensive exam) or PHSIO 601 (post-comprehensive exam). The assistantship appointments typically originate with the department of the faculty advisor. If no faculty advisor has been identified, as likely the situation with first year doctoral students, please consult with the Integrative and Biomedical Physiology Program Chair. It is the responsibility of the faculty mentor to secure funding after the 1st year for individual students. Limited support may be available through the Integrative and Biomedical Physiology IGDP, at the discretion of the Program Chair. Questions regarding student registration status can be directed to Terrie Young in the Huck Institutes.

Vacation and Leave Policy

The normal appointment to a position in the Integrative and Biomedical Physiology Graduate Program is full-time with three weeks of annual vacation plus the holidays granted to university employees. **Arrangements for leave must be done in consultation with the student's faculty advisor or the Program Chair and should not compromise fulfillment of any obligations regarding coursework or research activities required of the student.** Any period of vacation without prior approval of the Program Chair or advisor is considered a violation of policy and nullifies all previous funding arrangements. In some instances it will be appropriate for a student to spend time away from the PSU campus in other laboratories or in acquiring advanced training. Such experiences should be planned in consultation with the student's advisor. Time spent in such activities does not count as vacation.

Thesis Submission and Exit Interview

Upon completion of the degree, students are to provide the Integrative and Biomedical Physiology Program Chair with a paper copy of their thesis (unbound is acceptable). Students will also participate in a Physiology Program Exit Interview and be asked to complete an Exit Survey by the Huck Institutes. For the latter, students will be contacted by the Huck personnel for the completion of the survey.

Activate Intent to Graduate

At the beginning of the semester that you intend to graduate, visit LionPATH (<http://www.registrar.psu.edu/graduation/intent.cfm>) and follow the link for *Notifying the University of Your Intent to Graduate*. Helpful information regarding important graduation deadlines can also be found at <http://www.gradschool.psu.edu/current-students/etd/> and specifically <http://www.gradschool.psu.edu/current-students/etd/thesisdissertationperformance-calendar/>.

Teaching (optional)

Teaching assistant (TA) opportunities are available for Integrative and Biomedical Physiology students who would like to improve their teaching skills and gain practical teaching experience in a classroom setting. Students who are interested in this option should seek advice early on from their advisor and Program Chair to help decide on the best time for this experience. In order to TA, students must take a teaching training course such as BIOL 598A (Experiential Teaching in Biology, 2 cr) or the non-credit New Instructor Orientation (NIO) (<http://www.schreyerinstitute.psu.edu/NIO/>) offered by the Schreyer Institute of Teaching Excellence. International graduate students must pass an English proficiency exam (see English Proficiency section) before taking on any teaching duties. Any students who would like additional teaching experience and recognition of commitment to college teaching may consider earning a Teaching Certificate from the Graduate School. Information about the requirements for the Graduate School Teaching Certificate can be found at <http://www.gradschool.psu.edu/current-students/tacert/>.

Integrative and Biomedical Physiology Graduate Program Ph.D Requirements

General Information

General requirements for completion of the doctorate degree are based upon a period of semesters of full-time on-campus residence, passing the Integrative and Biomedical Physiology candidacy exam, satisfactory completion of physiology course requirements and university credit requirements, fulfillment of a communications requirement, passing of a comprehensive examination, and the writing and satisfactory defense of a research thesis. No specified number of courses completed or credits earned will assure attainment of the doctorate. A doctoral program consists of such a combination of courses, seminars, individual study and research as meets the minimum requirements of the Integrative and Biomedical Physiology Graduate Program and as approved by the Doctoral Thesis Committee for each individual student. Official entry into the doctorate does not occur until a student passes the Integrative and Biomedical Physiology candidacy exam. A Master's degree is not a prerequisite for the Ph.D. degree.

New graduate and M.D./Ph.D. students should become acquainted with the Integrative and Biomedical Physiology Program upon entry (<http://www.huck.psu.edu/education/physiology/>). Efforts should be made to meet other graduate students and especially your assigned peer mentor. The entering student should also become familiar with members of the faculty and the general thrust of each faculty member's research. Bi semester meetings for Integrative and Biomedical Physiology Program graduate students (time to be determined by the student representative) serve as an important opportunity for students to interact and share experiences.

Bi-Semester Student Meetings: It is expected that all graduate students in the Integrative and Biomedical Physiology IGDP will attend scheduled student meetings, arranged at a mutual time, for a period of scientific exchange and dialogue, often focusing on career development issues. The format for each meeting will be determined by student representatives in consultation with the Program Chair. The Program Chair should be notified if students are unable to attend a meeting.

Huck Graduate Student Advisory Committee (HGSAC)

Integrative and Biomedical Physiology students are encouraged to join and participate in activities sponsored by the Huck Graduate Student Advisory Committee (HGSAC). HGSAC is a committee of ~15 students representing all of the graduate programs in the Huck Institutes of the Life Sciences. Its mission is to broadly promote graduate student interests, facilitate communication between students and faculty, and help guide students in their career plans. More information is available at:

http://www.huck.psu.edu/content/graduate-programs/career_professional_development/graduate_student_advisor_committee

Individual Development Plan (IDP): Students are required to create an individual development plan using the myIDP website (<http://myidp.sciencecareers.org>) in year 2, with revisions made yearly thereafter. Students are required to attend yearly IDP planning sessions. Attendance is documented to the Program Chair. Students will be afforded many opportunities throughout the year for career development activities and are strongly encouraged to participate as schedules permit.

Regular Thesis Committee Meetings: Starting in the second year, students are expected to meet with their thesis committees regularly, at least once per year, and preferably twice per year. Please utilize the form on page 17 to document that the meeting has occurred and satisfactory progress achieved. The form should be submitted to Deb Murray (dkm9@psu.edu). Failure to have regular committee members could jeopardize graduate education funding.

Course Requirements

Year 1 (*Note: Deviations from 1st year coursework requires approval by the Program Chair*)

Fall Semester

NUTRN 501 (4) Regulation of Nutrient Metabolism I
PHSIO 571 (3) Cellular and Integrative Physiology I
PHSIO 596 (2) Cell and Molecular Biology (students attend BMB 251)
PHSIO 596 (1) two, eight-week rotations
KINES 590B Noll Seminar Series or equivalent (i.e. MCIBS 590) (1)
Online SARI Training

Spring Semester (*Note: Students must register during October of the previous semester*)

PHSIO 572 (3) Cellular and Integrative Physiology II
VBSC 432/BMB 432/MICRB 432 (3) Advanced Immunology
PHSIO 596 (1) two, eight-week rotations or one, sixteen-week rotation
NUTR 508 Critical Readings in Molecular Nutrition (1.5)
KINES 590 B Noll Seminar Series or MCIBS 590 (1)
MCIBS 591 (1) Ethics in the Life Sciences

Year 2

Fall Semester (*Note: Students must register during February of the previous semester*)

STAT 501(3) Regression Methods
PHSIO 600 (3-5) Thesis Research
Register for and attend a seminar series (of the students choosing) (1)
-electives (in consultation with mentor)

Spring Semester (*Note: Students must register during October of the previous semester*)

STAT 502 (3) Analysis of Variance and Design or equivalent
PHSIO 590 (1) Colloquium
PHSIO 600 (1-6) Thesis Research
Register for and attend a seminar series (in consultation with advisor) (1)
-electives (in consultation with mentor)
PHSIO 510 (3) Physiological Adaptations to Stress (*strongly recommended but not required*)

Year 3

Fall Semester

PHSIO 590 (1) Colloquium
PHSIO 600 (6-8) Thesis Research
Attend a seminar series (in consultation with advisor) (1)

Details of these courses are described in Appendix I (pg. 25). Deviations from 1st year coursework require permission by the Program Chair, and granted only with significant deficiencies. Thereafter, students are encouraged to take appropriate elective courses pertaining to their area of interest in consultation with their faculty advisor. Students are responsible for registering for classes in a timely fashion during October or February of the preceding semester. Some courses (particularly Statistics) fill up quickly and it is an unacceptable excuse to postpone completion of core program requirements due to failure to observe registration deadlines.

Responsible Conduct of Research Training Requirement

All new students in the Integrative and Biomedical Physiology program will be required to complete the online CITI (Collaborative Institutional Training Initiative) Biomedical Science Responsible Conduct of Research (RCR) training course during their first semester. This online course will supplement in-class, discussion-based RCR training provided in MCIBS 591, Ethics in the Life Sciences, a 1-credit required course taken during the second year.

First year students should complete the online CITI RCR course during or before the Orientation. To register, go to the Penn State CITI website <http://citi.psu.edu/> where you will find instructions. Select your campus, then select Pennsylvania State University Courses and register for the Biomedical Responsible Conduct of Research Course. Students must work on their own to complete the course modules and pass the on-line quizzes. All modules must be completed before 12:00 noon, August 31, 2016, and a copy of the student's Completion Report must be submitted to the Program administrative office (101 LSB or email tly2@psu.edu).

Laboratory Rotations

Doctoral students are required to rotate through **at least** three laboratories during their first two semesters before choosing a thesis advisor. Additional rotations in the second summer and/or fall semester are permitted only by approval of the Integrative and Biomedical Physiology Program Chair. Rotations (n=2) for the first semester will be for approximately eight weeks each depending upon the preference of the Principal Investigator of the laboratory. The rotation for the spring semester will be approximately 16 weeks in duration, or n=2, eight week rotations depending on student circumstances and in consultation with the Program Chair. Students will work with the Integrative and Biomedical Physiology Program Chair prior to matriculation (e.g. the summer before you start school) to select laboratory experiences. It is expected that the student spend up to 20 hours per week in the laboratory of the host mentor and function as a regular member of the laboratory team. **Each rotation must be in a different laboratory**, unless special exception is granted by the Integrative and Biomedical Physiology Program Chair. For the first two rotations, students may select laboratories based on research interests and the faculty member's willingness to accept students into their laboratory. The Integrative and Biomedical Physiology Program Chair is available to assist students with this selection. Prior to the 3rd rotation, students **must** meet with the Integrative and Biomedical Physiology Program Chair and discuss appropriate options. Each rotation is subject to a formal evaluation by the appropriate laboratory supervisor. Students are required to write a one-page summary of their experience during each rotation, and will also be evaluated by each supervising mentor. The report must be submitted to the Integrative and Biomedical Physiology Program Chair via the Staff Assistant within two weeks after completion of the rotation, at which time a discussion of the evaluation will occur. Laboratory rotations are part of each student's eligibility to take the candidacy examination. Rotations may or may not be indicated for M.S. students and determined in consultation with the Program Chair.

Communications Competency

The purpose of this requirement is for students to practice and refine their skills in listening to, orally presenting, and writing of technical communications. To meet this requirement, the student should participate in activities such as: making oral or poster presentations at scientific conferences, department seminars, and the annual Integrative and Biomedical Physiology program retreat; participating in journal clubs; conducting formal and informal teaching; and contribute to the writing of scientific manuscripts and research proposals. The

student should maintain a continuous record including dates, locations and titles and abstracts that describe the individual activities. Before scheduling the thesis defense, the student's advisor will forward to the Chair of the Integrative and Biomedical Physiology Program the student's self-report of communications activities with a memo of approval signed by the advisor.

Analytical Competency

The intent of this requirement is for students to learn quantitative techniques for designing experiments and for analyzing data. At a time shortly after the candidacy exam has been successfully passed, the student and advisor in consultation with the student's Doctoral Committee will submit a plan for attaining analytical competency to the Chair of the Integrative and Biomedical Physiology Program. Typically, this plan will include formal coursework in statistics (STAT 501/502 required for PhD students) or bioinformatics.

Candidacy Examination

Objectives of the candidacy exam:

- To fulfill the Graduate School's requirements for admission into a Ph.D. program.
- To assess a student's overall knowledge and understanding of general physiological principles and first year concepts.
- To determine the student's ability to synthesize and integrate physiological facts and concepts and express these in writing and orally.
- To evaluate the student's strengths and weaknesses relative to specific areas of physiology.
- To serve as the mechanism for screening and selection of students for admission into the Integrative and Biomedical Physiology Ph.D. program.
- To assess English Competence in writing and speaking, as required by the Graduate School.

When will the exam be given and who should take it?

- According to Graduate School requirements, the candidacy exam may be given after at least 18 credits have been earned in graduate courses beyond the baccalaureate and within 3 semesters of program entry. The examination should be taken within three semesters (summer sessions do not count) of entry into the doctoral program. **Integrative and Biomedical Physiology IGDP students should be prepared to take the candidacy exam ~ during the 3rd and 4th weeks in May 2018.**
- The Candidacy Examination Scheduling Form (page 13) must be completed and sent to the Integrative and Biomedical Physiology Program Chair and Huck staff assistant (Terrie Young, tly2@psu.edu) at least one week before the exam date.
- A student transferring from another graduate school with 30 or more transfer credits must take the candidacy examination prior to earning more than 25 credits at Penn State.

Nature of the exam and who will prepare

- In accordance with Graduate School requirements, the examination will be administered by Graduate Faculty members in the Integrative and Biomedical Physiology Program. The Chair of the Candidacy Examining Committee, in consultation with the Integrative and Biomedical Physiology Program Chair, will appoint additional members of the Candidacy Exam Committee to ensure adequate breadth of coverage of physiology. The Candidacy Examining Committee will be a standing committee that

consists of at least 3 but not more than 6 Integrative and Biomedical Physiology faculty members. The Examining Committee will prepare the questions for the exam and grade them. Many faculty contribute questions, mostly those who taught the respective sections in the PHSIO 571/572, but all first year course instructors are solicited for questions. Some but not all “question contributors” are members of “oral examining committee”. All students will be given the same written examination on the same days. Prior to the oral exam, a conference will be held so that members of the oral examining committee are aware of strengths and weaknesses identified by the “graders”. The “graders” are, in most cases, the same faculty who provided the questions.

- The Chair of the Candidacy Examining Committee will choose 2 to 3 questions from each of 8 areas of physiology from a pool of already created questions which fulfill the above-stated candidacy objectives. The physiology faculty at large will be asked to help develop, and periodically update, the pool of candidacy questions.
- Each student will be required to answer 4 to 8 questions on the first day, and 4 to 8 questions on the second day for a total of 8 to 16 questions over 2 days.
- The questions to be answered on each day will each represent a different testing area, and will be chosen by the student from a pool of 2 to 3 questions per testing area. The total allotted time is four hours each day, and the exam will be closed book. Students may use a laptop computer that is provided to them to type their answers.
- After at least 1 week, but not more than 2 weeks (1 week is recommended), a 2 hour oral exam will be given by members of the examining committee. This exam will function to explore areas of weakness noted on the written exam and to assess the student’s abilities in the area of oral expression. The oral exam will serve as the basis for evaluating the candidate’s proficiency in listening and speaking. Questions in the oral exam may also focus on aspects of the previously completed written answers if they require more explanation, or on other topics covered in the academic year.
- Students are required to perform satisfactorily on all portions of the exam. This format allows students to demonstrate rapid integration of acquired knowledge and also tests the ability to think about a problem over a longer interval. The final decision (Pass, Pass with deficiencies, Fail with right to reapply, Fail) on the outcome of the entire exam will be made immediately following the oral component, and communicated to the student.
- Students are encouraged to schedule a practice session with faculty members in order to develop oral organization and presentation skills. This should be arranged for the whole student group.
- English competency will be assessed by the candidacy committee based on the student’s oral and written responses to the exam questions.

Grading of the Exam

- Each faculty member of the Examining Committee will be assigned written questions to grade based on their area of expertise. Integrative and Biomedical Physiology faculty members outside the examining committee may be consulted to assist with grading of questions if necessary. The Chair of the Examining Committee, in consultation with the other committee members, will determine an overall grade of Pass or Fail for the written exam. Regardless of the grade on the written exam, students will take the oral exam. The Examining Committee will assess the student’s performance on the oral exam, and, considering the results of both exams, recommend or not recommend to the Integrative and Biomedical Physiology Program Chair that the student be admitted to the Ph.D. program in Integrative

and Biomedical Physiology. Students will be afforded an opportunity to review their written answers prior to the oral examination but not allowed to written copies of their answers.

- The results of the exam will be communicated by the Chair of the Examining Committee to the student and the Integrative and Biomedical Physiology Program Chair within one week of completing the oral exam. These results will consist of whether the student has passed or failed the exam and a general evaluation of the student's performance (see attached form). This evaluation will indicate general strengths and weaknesses in Physiology subject matter. It will also indicate proficiency in English writing and speaking. Recommendations on how areas of weakness should be remediated will be included. NOTE: results usually provided on the day of the oral exam, by the oral examining committee.
- The report of Pass or Fail to the Graduate School will be determined jointly by the Candidacy Examining Committee, and the Integrative and Biomedical Physiology Program Chair. This decision will be based on three major factors: candidacy exam performances; graduate scholarship, and laboratory rotations' evaluations. In the event of marginal student performance, it is possible to have a Fail decision with a repeat of the examination (right to reapply).
- The student must complete any technical or English language remediations prescribed by the Candidacy Examining Committee within the time frame specified by the examining committee, and it is the candidate's responsibility to initiate remediation activities as specified by the candidacy exam committee. A memo certifying that the remediations have been fulfilled must be sent from the student's advisor to the Integrative and Biomedical Physiology Program Chair. Failure to remediate deficiencies within the specified time frame will result in termination from the program, in accordance with Appendix III of the Graduate School Bulletin (<http://bulletins.psu.edu/graduate/appendices/appendix3>).

Intercollege Graduate Degree Program in Integrative and Biomedical Physiology
Doctoral Candidacy Examination Scheduling Form

Name of Candidate: _____

PSU Student ID #: _____

Proposed Date, Time and Location: _____

Examining Committee: (Type names)

Members: _____

Has the student fulfilled the graduate school's communications requirement?

Has the student provided official confirmation of baccalaureate degree?

Is the student registered as a full-time or part-time student for the semester in which the candidacy examination is taken (excluding summer)?

The objective of this exam is to assess a student's overall knowledge and understanding of general physiological principles. The student should be tested in at least eight areas, such as those suggested below. Please indicate which committee member is responsible for each area to be tested.

Related Areas	Committee Member	
Cardiorespiratory and vascular physiology		
Cellular and Molecular Biology		
Endocrine System, Metabolism and Immunology		
Gastrointestinal System		
Neurophysiology and membrane biophysics		
Renal System		
Reproductive Biology		
Musculoskeletal System		
ALL STUDENTS:		
English Competence – speaking	ALL	-----
English Competence – writing	ALL	-----

RETURN COMPLETED FORM TO Terrie Young (tly2@psu.edu) in 101 LIFE SCIENCES FOR APPROVAL AT LEAST 1 WEEK PRIOR TO EXAM.

Approved by: Candidacy Exam Committee Chair _____
(signature)

**Intercollege Graduate Degree Program in Integrative and Biomedical Physiology
Doctoral Candidacy Examination Results**

Name of Candidate: _____ PSU Student ID #: _____

Date, Time and Location: _____

Examining Committee:	(Names)	(Signatures)
Members:	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____

Related Areas	Adequate	Deficient
Cardiorespiratory and vascular physiology		
Cellular and Molecular Biology		
Endocrine/ Metabolism/Immunology		
Gastrointestinal System		
Neurophysiology and membrane biophysics		
Renal System		
Reproductive Biology		
Musculoskeletal System		
English Competence – speaking		
English Competence – writing		

Candidate Passes: _____ Accept as a Candidate
 _____ Accept with Deficiencies
 Candidate Fails: _____ Withdraw from the program
 _____ Right to Reapply

Plan to remediate technical deficiencies or deficiencies in English Competence if necessary (use back if necessary; must include time frame for remediation and consequences for remediation failure):

Candidacy Exam Committee Chair
Chair

Integrative and Biomedical Physiology Program

(signature)

(signature)

Advisors and Doctoral Committees

After the student has been admitted to the doctoral program, the student needs to inform the Physiology Program Chair and HUCK program staff of advisor selection. This decision will be influenced by the outcome of the laboratory rotations, as outlined above. **Arrangements for and approval of term-by-term details of the student schedule through the remainder of the graduate program is the function of the advisor.**

After admission to candidacy, the general guidance of a doctoral candidate is the responsibility of the Doctoral Committee, which consists of four or more members of the Graduate Faculty. The committee must include at least two senior members of the Graduate Faculty and at least one member from outside the Integrative and Biomedical Physiology Program. The Dean of the Graduate School, upon the recommendation of the advisor and the Chair of the Integrative and Biomedical Physiology Program, will appoint the Doctoral Committee. The Integrative and Biomedical Physiology staff assistant, Terrie Young (tly2@psu.edu) should be informed of the student's faculty committee composition.

The Doctoral Committee is responsible for establishing the broad outline of the student's program and should review the program as soon as possible after admission to candidacy. The student and his/her advisor should schedule this review. The Committee will prepare, administer, and evaluate the examinations of the candidate and supervise and approve the thesis. The Graduate School requires that all committee members be present at each examination, except in the case of a last minute emergency. In the latter case, the absent committee member should individually examine the candidate as soon as possible afterwards. Alternatively, a temporary substitute may be appointed, except in the case of the final defense.

According to the Graduate Degree programs Bulletin published by the Graduate School regarding Doctoral Committees: (<http://bulletins.psu.edu/graduate/degree requirements/>):

- 4 person minimum of approved PSU Graduate Faculty.
- 2 members must be inside the major and at least 1 member must be outside the major and serve as the "Outside Field Member." Note - the outside member must be a member of the approved PSU Graduate Faculty. The outside member for intercollege graduate programs may be inside the major but represent another department. Specifically, the primary appointment of at least one regular member of the doctoral committee must be in an administrative unit that is outside the unit in which the dissertation/performance adviser's primary appointment is held (i.e., the individual's tenure home). This committee member is referred to as the "Outside Unit Member." In some cases, an individual may have a primary appointment outside the administrative home of the student's dissertation adviser and also represent a field outside the student's major field of study; in such cases, the same individual may serve as both the Outside Field Member and the Outside Unit Member.
- A person not affiliated with PSU may be added as a "Special Member" (beyond the 4 members of the approved PSU Graduate Faculty) upon recommendation of the Chair of the Program and approval of the Graduate Dean. A memo plus the individual's C.V. must be drafted with approval signature spaces for the Integrative and Biomedical Physiology Program Chair plus Ms. Lori Anne Hawn (Director, Graduate Enrollment). Please contact the Staff Assistant to assist with this paperwork. A Special Member is expected to participate fully in the functions of the doctoral committee. If the Special Member is asked only to read and approve the doctoral dissertation or to evaluate the final performance, that person is designated a Special Signatory.
- The committee chair be a member of the approved PSU Graduate Faculty. Typically it's your faculty advisor.
- The doctoral candidate and three committee members must be physically present for the comprehensive exam and defense. No more than one person may be present via telephone. Telephone or video conference arrangements must be approved by the Dean of the Graduate School. The Staff Assistant has a form letter for this special request.

- Need approval of 2/3 of the committee members for passing comprehensive exam and defense dissertation.
- Need to submit paperwork 3-4 weeks prior to your scheduled comprehensive exam and defense. Please contact Staff Assistant Terrie Young (tly2@psu.edu) for assistance with submitting these forms.

Thesis Proposal and Six Month Reviews

- It is the responsibility of the student to outline to the Doctoral Committee the means by which the thesis requirement is to be satisfied. The thesis should examine a hypothesis or test several theories with a unifying theme. The aims of your research will be developed with the guidance of your advisor. The student, after providing background to the problem, the specific aims of the proposed research, and a brief description of available preliminary data, will then write a thesis proposal. The student should present this proposal orally at the first meeting of the Committee. The proposal serves as an amendable agreement between the student and the Committee and gives a clear goal for finishing the thesis. As the student and his/her advisor cannot predict the future with certainty, this document should be considered as a starting point only. The thesis research or new findings in the field may lead down unexpected paths. The student should amend the thesis proposal as necessary and always seek the approval of the Committee for such diversions.
- **The student is required to meet formally with the Doctoral Committee to review the research progress, problems, and obstacles at least once per year starting during the second year.**
Scheduling the meetings is the responsibility of the student in consultation with the faculty advisor, as is informing the Huck Program Office of the exact date and time of the meetings. A progress form (see page 17) must be filled out and signed by all committee members as documentation of successful progress in the program. Failure to meet formally with the Doctoral Committee as noted will be interpreted as insufficient progress toward degree with associated consequences (see <http://bulletins.psu.edu/graduate/appendices/appendix1>, <http://bulletins.psu.edu/graduate/appendices/appendix3>, <http://bulletins.psu.edu/graduate/appendices/appendix4>).

Graduate Student Doctoral Committee Meeting Record

Students in the Intercollege Graduate Degree Program in Integrative and Biomedical Physiology are required to have 1 to 2 meetings per year with their thesis advisory committee.

_____, had a committee meeting on _____.
Student Name Date

Signature

Satisfactory Progress Yes or No

Thesis Advisor _____
Signature _____

Committee Member _____
Signature _____

Committee Member _____
Signature _____

Committee Member _____
Signature _____

Committee Member _____
Signature _____

Committee Disposition: _____ **Sufficient Progress** _____ **Insufficient Progress**

Committee's Perception of Candidate Progress (please provide a specific **plan for remediation** if needed and **associated consequences** if sufficient progress is not made; continue on back if necessary):

Comprehensive Examination

Purpose of the Comprehensive Examination

The purpose of the Integrative and Biomedical Physiology Program Comprehensive Exam is to assess students for their preparedness to proceed to the dedicated research phase of their doctoral degree training process. The ability of the student to identify important areas of research, synthesize a hypothesis from contemporary literature, and develop a practical experimental plan are all key elements in this examination. Essentially, the exam addresses the ability of the student to progress from theoretical answers provided in response to course exam questions and advance to identifying important questions on their own and developing a realistic plan to answer these questions. As such, this exam represents an important opportunity for the thesis committee to identify those students capable of obtaining a doctoral degree and separating them from those students that are not prepared to proceed with their doctoral research. Paperwork for the Comprehensive Examination must be completed and submitted to the Integrative and Biomedical Physiology staff assistant at least three weeks prior to the proposed test date.

Written Comprehensive Exam

Written Comprehensive Exam Format: The format of the comprehensive exam will be determined by the student's primary advisory **and** the doctoral committee. For example, the comprehensive exam may be the development of an experimental plan (grant proposal) that could be reasonably expected to refute or provide substantive support for the proposed hypothesis. **Alternatively**, the format for the comprehensive exam may consist of a series of in depth questions related to the candidate's primary area of interest and based on classic and current literature. The questions will be written by the doctoral committee members, and the written exam will be administered over a two day period, with the student writing for 6 to 8 hours per day. The written exam will be followed approximately one week later by an oral exam by the doctoral dissertation committee.

Suggested format for the grant proposal exam is a 1 page specific aims, 2 page background, 2 page preliminary evidence, which should include the most relevant data derived from the literature that directly supports the hypothesis, and 5 pages for the experimental plan. The experimental plan should provide enough detail regarding methods to demonstrate to the committee that the student understands the principles of the experimental techniques. Specific details of techniques should be avoided in the comprehensive written application; however, the student should be prepared to answer detailed questions regarding the principles of any technique proposed in the exam, including statistical analysis. The proposal should no more than 10 pages, single-spaced (or exactly 12 point spacing) in 12-point Arial font. Margins will be no smaller than 0.8 inches. Figures that support or help clarify the proposal may be provided in an appendix and are not counted in the 10-page exam limit. Further, the document will be referenced and the references are also not counted in the 10-page limit.

Topic: The exam will be the development of an experimental plan for a testable hypothesis i.e. a NIH-style grant application. However, a common error is to propose more than can be defended in the time and space provided. Therefore, the student may wish to model their exam on a specific aim from a NIH RO1 application rather than a full application. The exam topic may be directly related to the thesis research for the student. Indeed, meritorious applications that are related to the thesis research should be considered for submission to a granting agency for external funding consideration. The student may also choose a topic separate from his/her thesis research if agreed upon by both the advisor and the student. Hypotheses cannot be prescribed by the mentor or from any of the mentor's current research grants.

All students will provide a letter of intent for the comprehensive topic to the Doctoral Committee for comments and approval. The letter of intent will be no longer than one page and provide a background and rationale, a clear hypothesis, and the specific aims for the proposal, 8 weeks prior to the exam date.

Oral Comprehensive Exam

For the grant proposal mechanism, the student should prepare a 40 min oral presentation including background and rationale, supportive data and figures to clarify the proposal and the experimental plan. The student can expect to be questioned during and after the presentation. For the class/current literature oral exam, the student can expect 1 to 2 hours of questioning by the doctoral dissertation committee.

Timeline

According to Penn State policy the student must complete the comprehensive exam within (6) semesters of the candidacy exam. Therefore, if the student completes the candidacy exam at the end of the spring semester of their first year, the student is encouraged to use the spring or summer semester of their third year for the comprehensive exam and finish the comprehensive exam by end of the following fall semester. After acceptance of the letter of intent the student will have up to 8 weeks to prepare for the comprehensive exam. The student must submit the written exam to all committee members 1 week before the exam date or 7 weeks from acceptance of the letter of intent. All necessary forms required by the Penn State Graduate School must be completed at least one week in advance of the exam (please see Terrie Young (tly2@psu.edu) for assistance with the paperwork).

Grading

The student may receive a pass or fail for the comprehensive exam. If the student receives a pass the student will be graded as either below average, average, above average or exceptional. If the student fails, the Doctoral Committee may decide to allow the student a second opportunity to take the exam or may decide the student must leave the Integrative and Biomedical Physiology Graduate Program in accordance with Penn State policy. The student will be afforded two opportunities to pass the exam.

Final Oral Examination / The Thesis Defense

A final oral examination will be given in defense of the thesis. A meeting of all Doctoral Committee members must be held within six months of the defense at which time it will be determined if the student has completed all requirements and may proceed. The final examination must be held at least three months after passing the comprehensive and at least seven weeks before the commencement in which the student wishes to participate. Details of this requirement are given in the Graduate Handbook (<http://www.psu.edu/bulletins/whitebook/>). The Integrative and Biomedical Physiology Graduate Program Chair must request the Dean of the Graduate School to schedule the examination and give at least six weeks' notice. No examination will be scheduled until a complete "final draft" of the thesis has been received by all committee members and by the Integrative and Biomedical Physiology Program Chair. It is required that the final draft be *thoroughly reviewed by the student's advisor* prior to distribution to the committee members and that all copies must be given to committee members *no less than 14 days* before the scheduled defense.

If more than five years have elapsed between passing of the comprehensive examination and the final oral examination, it is required that a second comprehensive exam is passed before the final oral is scheduled.

The final oral examination is open to the public and, although largely related to the thesis, may cover the whole of the candidate's program. A favorable vote of at least two-thirds of the committee is required for passing. If failure is determined, the committee is responsible to decide whether a second examination may be taken. Thesis defense paperwork must be completed and submitted to the Integrative and Biomedical Physiology staff assistant at least three weeks prior to the proposed test date. The public portion of the defense must be advertised to all relevant listservs. It is the responsibility of the student and mentor to provide this information to the HUCK program assistant (tly2@psu.edu) at least 1 week in advance of the defense for distribution.

Expectation: It is expected that each student will have a minimum of three first-authored manuscripts (based on his/her research) that have been either accepted and/or published in a peer reviewed journal.

Additional Requirements for the Ph.D.

Residence. There is no minimum number of credits or semesters of study required for the Ph.D., but during a 12-month interval between admission to candidacy and completion of the program, the candidate must spend at least two semesters registered as a full-time student. This will usually be achieved over the course of the "normal" second year of study in the Integrative and Biomedical Physiology Program. "Full time" is defined as registration for at least 9 credits for those supported by a fellowship or traineeship. During the second year, these credit requirements may be met only in part by course work. The balance of the required credit load should be taken as Physiology 600, Thesis Research (on campus). The number of PHSIO 600 credits should accurately reflect the effort of the students in thesis research. Work under Physiology 600 can be given the deferred grade of "R", but only 12 credits of "R" can be converted to a conventional grade in a given Ph.D. program.

Continuous Registration. After the two-semester residency requirement (above) is met, status as a student must be maintained by continuous registration until the thesis is accepted. The details of this requirement are given at <http://bulletins.psu.edu/graduate/degree requirements/degreeReq2>. During this interval, the full-time student should register for Physiology 601, Thesis Preparation, which involves no credits and is graded "R" (research). Physiology 601 cannot be used until the semester after the comprehensive exam is passed. "R" grades from Physiology 601 cannot be converted to conventional grades.

It is important that students use the Physiology 601 registration after the comprehensive requirement is filled, as it involves a substantial reduction in tuition. If courses are taken during this interval (> 3 credits per semester), an additional tuition fee must be paid. Normally, students should complete their course work and comprehensive exam as soon as possible; efforts should be devoted entirely to thesis research and writing after this time.

Thesis. The Ph.D. thesis must be prepared in accordance with strict and specified guidelines, as detailed in the Thesis Guide, (<http://www.gradschool.psu.edu/current-students/etd/>). Students are advised to work closely with that office and the Guide in preparation of their dissertation. A format check will be required by the Graduate School and it is the student's responsibility to meet all imposed deadlines.

Examination Schedule

The above schedule outlines the time course over which the various examinations required in the Integrative and Biomedical Physiology Program must be completed. The timetable is based on the academic year, September to August. The faculty, Doctoral Committee and student will participate in the scheduling of these examinations. Beyond the candidacy examination, however, it is the ultimate responsibility of each student to be certain that progression of the program and completion of the appropriate examinations are accomplished in a timely fashion. Examinations should be scheduled as outlined in these guidelines, based on the assumption that the entire Graduate Program will require four years of effort.

The Chair of the Doctoral Committee, the Chair of the Graduate Program and the Program Coordinator will aid the student in scheduling and arranging the required examinations. Permission to postpone any of the examinations beyond the interval indicated must be obtained in advance by the individual student by arrangement with the Chair of the Doctoral Committee and the Program Chair.

Important Notice: After completing or prior to scheduling any of the above requirements it is essential that you contact the HUCK staff assistant (Terrie Young, tly2@psu.edu). Most of these steps in your progress require formal notification and/or scheduling through the Graduate Office. Please inform the office of your progress and intentions at least three weeks in advance.

Integrative and Biomedical Physiology Graduate Program Masters Requirements

During the first year, students will identify a faculty advisor with whom a project will be done. The first year is structured much like the Ph.D. program, with similar course requirements, depending on individual background and future goals. The second year can be modified to accommodate the goals of the student. All masters students must have a minimum of 30 credits at the 400 – 600 levels, a “B” earned in all physiology course taken, and a 3.0 overall GPA. A final thesis defense is not required by the Graduate School but strongly encouraged. A public oral presentation of the final research project is required by the program. The public portion of the defense must be advertised to all relevant listservs. It is the responsibility of the student and mentor to provide this information to the HUCK program assistant (tly2@psu.edu) at least 1 week in advance of the defense for distribution.

The masters thesis option requires a minimum of the following:

- 1 credit of Colloquium (PHSIO 590)
- 1 credit of Ethics (MCIBS 591 or equivalent)
- 14 credits in the major at the 400 – 500 levels (which must include PHSIO 571/572/590)
- 18 credits at the 500 – 600 levels (excluding PHSIO 600 and must include a STAT course, typically STAT 500)
- 6 credits PHSIO 600 (6 credits is the limit that can receive a A-F grade)
- SARI training

Upon consultation with the faculty advisor, the student selects a thesis committee comprised of three approval graduate faculty members, writes a thesis based on original research, defends his/her work, and provides a public seminar on his/her work.

A non-thesis masters option is only by approval of the Program Chair and under extreme circumstances such as medical illness. The following is the minimum required:

- 1 credit of Ethics (MCIBS 591 or equivalent)
- 18 credits in the major at the 500 level
- 6 credits of PHSIO 596

Students must have either a first authored manuscript (based on his/her research) that has been either accepted and/or published in a peer reviewed journal or a thorough but focused review of the literature in a contemporary area of literature in leading to a written paper. Either item is to be approved by the student’s faculty advisor, given to the Integrative and Biomedical Physiology Program Chair for evaluation and final approval.

Please note - PHSIO 596 (Independent Study/Rotations), and BIOL598A (Teaching) credits all count toward the 30 credits. If all course credits and requirements are met, M.S. students do not have to be registered for classes while writing and/or defending his/her work.

Additional requirements for each option are contained in this booklet. Students must present their thesis in accordance with the Penn State University guidelines as described in the THESIS GUIDE Requirements for the Preparation of Master's and Doctoral Theses <http://www.gradschool.psu.edu/current-students/etd/>.

Integrative and Biomedical Physiology Graduate Program

IUG Requirements and/or Honors Options

The Integrated Undergraduate/Graduate (IUG) program in the Schreyer Honors College (SHC) is designed exclusively for Schreyer Scholars who have exceptional academic records; whose progress in the major is so advanced that they would be taking graduate courses in later semesters even without IUG status; whose general education progress and plans indicate a readiness to forge ahead with specialization; and who are ready for the particular challenge of graduate work, research and advancing knowledge. Schreyer Scholars who believe they fit this profile are encouraged to apply to be IUG Scholars. Schreyer Honors Scholars can also complete honors research in physiology, so long as the research is completed under the direction of a Integrative and Biomedical Physiology IGDP faculty member.

Application: The application process for IUG must begin during the 4th, 5th or 6th semester of study. (Students who are not in the Schreyer Honors College can not apply for graduate studies through this IUG program. Instead, those students should contact the Associate Dean in the College of their major or desired graduate program to determine if there is an IUG program in effect in the college.)

Use the following link to learn more about the IUG Program and IUG Guidelines

[http://www.shc.psu.edu/students/iug/program/.](http://www.shc.psu.edu/students/iug/program/)

Required courses include: PHSIO 571, PHSIO 572, PHSIO 590, STAT 500.

Questions regarding the Integrative and Biomedical Physiology IUG:

Donna H. Korzick, Ph.D.
Chair, Intercollege Program in Integrative and Biomedical Physiology
106 Noll Laboratory
814-865-5679
dhk102@psu.edu

Questions regarding Honors in Integrative and Biomedical Physiology should be directed to:

James A. Pawelczyk, Ph.D.
Honors, Advisor
107 Noll Laboratory
jap18@psu.edu

Integrative and Biomedical Physiology Graduate Program Minor Requirements

The minor in Integrative and Biomedical Physiology augments the training of doctoral students with a coordinated group of courses that provide an integrated perspective of physiology from the molecular to the organismal level. Graduate School regulations dictate that "a minor consists of no fewer than 15 credits of integrated or articulated work in one field related to, but different from, that of the major." It is expected that most students pursuing the minor will be graduate degree candidates in basic biological sciences, health sciences, or bioengineering.

This minor requires the following coursework:

BIOL 472. If the student took a one-semester, upper-level undergraduate mammalian physiology course as an undergraduate, then this requirement may be waived with approval by the Chair of the Integrative and Biomedical Physiology Graduate Program.

PHSIO 571/572. If these courses are required for the major, then substitute an equal number of credits in 500-level Physiology elective courses.

A 3-credit, 500-level Physiology elective course.

Additional credits from 500-level Physiology courses or a relevant 400- or 500-level course so that the total course credits for the minor is 15. These 15 credits cannot include course work that is used to fulfill requirements in the student's major. Elective courses for the minor must be approved by the Chair of the Integrative and Biomedical Physiology Graduate Program.

Students must earn a grade of C or better in each course in the minor and maintain an overall average of 3.00 in the minor. One member of the student's major doctoral committee must be a faculty member in the Intercollege Graduate Degree Program in Integrative and Biomedical Physiology. Per the Graduate School, this minor must have the approval of the departments or committees responsible for both the major program and the Integrative and Biomedical Physiology Graduate Program Chair.

Topics Students and Thesis Advisors Should be Prepared to Discuss *Before* a Student is Accepted to a Laboratory¹

The Graduate Faculty at Penn State recognize the unique aspects of the relationship between students engaged in research as part of their graduate degree program, and their thesis advisor. In the best examples of this mutually beneficial relationship, both the faculty member and the student stand to gain much. The student learns both discipline-specific knowledge, and, more importantly, the skills to employ that knowledge in whatever pursuit the student eventually undertakes. With time, the faculty member gains a colleague who participates in not just in the technical aspects of the faculty member's research, but also contributes to the intellectual development of the research project.

To ensure that students know what is expected of them as they embark on this new and unique phase of their education, we provide this guiding document. This document is to be used to frame discussions between a new graduate student and a faculty member the student is considering for a thesis advisor. Certainly other related topics can and should be part of this important conversation. Faculty have unique perspectives and opinions about many of these topics, and thus it is important for a student to be sure he/she understands what the expectations will be upon joining the laboratory.

EXPECTATIONS OF GRADUATE STUDENTS WITHIN A LABORATORY

PROFESSIONALISM

- Honesty
- Communication
- Behavior

WORK ETHIC

- Attitude
- Time in Lab
- Time outside Lab

LABORATORY MANNERS

SELF MOTIVATION

FUNDING

EXPECTATIONS OF THESIS ADVISORS

- PROFESSIONALISM
- WORK ENVIRONMENT
- ACCESS (TO MENTOR)
- EXPECTATIONS
- GUIDANCE

¹ This document was unanimously approved by the Penn State Graduate Program Directors on May 05, 2006.

Appendix I

List of Required Integrative and Biomedical Physiology Courses for Doctoral Students (see LionPATH for registration: <http://www.registrar.psu.edu/lionpath/features.cfm>)

PHSIO 571. CELLULAR AND INTEGRATIVE PHYSIOLOGY I (3) Mammalian cardiovascular, respiratory, renal, and gastrointestinal systems. Prerequisite: **BIOL 472**

PHSIO 572. CELLULAR AND INTEGRATIVE PHYSIOLOGY II (3) Mammalian nervous, endocrine, metabolic, and reproductive systems. Prerequisite: **BIOL 472**

PHSIO 590. COLLOQUIUM (1 – 3, Spring) Professional skill development and individual seminar presentation by students and specific feedback provided by faculty.

PHSIO 508. Critical Readings in Molecular Nutrition (1.5) Understanding of approaches, methods and current concepts in molecular biology and nutrition through critical readings of current primary literature.

PHSIO 596. INDEPENDENT STUDIES / LABORATORY ROTATIONS (1-9 per semester) For students exploring either potential Ph.D. projects and faculty advisors or creative projects, including non-thesis research, which are supervised on an individual basis and which fall outside the scope of formal courses. Students receive a R (satisfactory/passing) or F (unsatisfactory/failing). Only R credits are counted for credit totals.

PHSIO 600. THESIS RESEARCH (1-9 per semester) For students who have been matched with a faculty advisor AND have not taken/passed the comprehensive exams. Students may receive A-F grades or R/F grades at any time. By the time a student passes his/her comprehensive exam, up to 12 credits worth of PHSIO 600 are permitted to have the A-F quality grade. In the semester in which you reach 12 credits, you may need to register twice for this course (i.e. one section for any remaining A-F credits, another section for the R grade credits).

PHSIO 601. THESIS PREPARATION (post comprehensive exam; 1 per semester) Each semester until graduation for those students who passed the comprehensive exam. This course appears on the transcript but does not have any grade or credit associated with it.

MCIBS 591. ETHICS IN THE LIFE SCIENCES (1, Fall and Spring) Students exam integrity and misconduct in life sciences research, including issues of data collection, publication, authorship, and peer review. Students receive A-F quality grades.

NUTRN 501. Regulation of Nutrient Metabolism I (4) Integration of nutritional, biomedical, biochemical, physiological, and hormonal processes involved in carbohydrate, lipid, and protein metabolism.

KINES 590B. Exercise Physiology Colloquium (1 per semester/maximum of 4) Continuing colloquia in exercise physiology which consists of individual lectures by outside speakers, students and faculty.

BMB 251 (audit). Cell and Molecular Biology (2) Students will attend BMB 251 and take all exams.

VB SC 432/B M B 432/MICRB 432. Advanced Immunology: Signaling in the Immune System (3) The study of signaling pathways that regulate the immune response.

STAT 501. Regression.

STAT 502. Analysis of Variance

Appendix II

Suggested Time Line for Doctoral and /or MS Candidates

First Year

Required course work (fall and spring semesters)

SARI Training

Laboratory rotations (fall, spring semesters and possibly summer semester)

May: Candidacy examination (for doctoral students prior to summer registration deadline)

Second Year

Selection of thesis advisor and research topic (1st yr. summer or 2nd yr. fall)

Communications requirement (fall semester)

Elective courses

Appointment of doctoral committee; first meeting to review thesis proposal (fall)

Thesis research (PHSIO 600 throughout year; do not use PHSIO 601)

Get approval of advisor and doctoral committee to have thesis proposal serve as comprehensive exam or
select two or three comprehensive exam topics for your committee to review (early spring)

Begin Comprehensive examination preparation (late spring - summer semester)

Fill residency requirement of 2 semesters after candidacy (use PHSIO 601 each semester after passing
the comprehensive exam)

Masters Thesis or Non-Thesis Completion

Third Year

November or December - first six-month committee review

May or June -second six month committee review

Comprehensive examination (late spring - summer semester)

Helpful hint: Prepare your figures, legends and tables for your thesis in a final form as you progress.

Review thesis preparation guidelines this year

Fourth and subsequent years

November or December - six-month committee review

May or June -six month committee review

Preparation and defense of dissertation

Students are required to complete the Ph.D. program within eight years from successful completion of
the candidacy exam.

Appendix III

The Huck Institutes of the Life Sciences Integrative and Biomedical Physiology - Masters of Science (MS)

Graduation Checksheet

Student Name _____
(last) (first)

PSU Student # _____

___ Are there at least 30 credits?

___ Does the student have at least a 3.0 GPA?

___ Are there 18 credits at the 500 & 600 level?

___ Are there 14 credits in courses in the major? (DO NOT count 600/610)

___ If there is a minor, are there at least six credits in the minor program of _____

___ Are there any missing or deferred grades?

___ Have requirements been completed within 8 years of admission?

If extension granted, through what semester/year? _____

___ Thesis Option

___ Are there six thesis credits (600/610)?

___ Are there no more than six thesis credits with a letter grade?

___ Has student submitted hard copy of thesis? (unbound okay)

___ 1 credit PHSIO 590

___ Non-Thesis Option (only by permission of Integrative and Biomedical Physiology Program Chair)

___ Has the student submitted an accepted 1st author manuscript or literature review?

___ Are there at least 18 credits in the major at the 500 level?

___ Are there 6 credits of PHSIO 596?

Initials _____

Date _____

Huck Institutes Internal Use

Appendix IV

Huck Institutes of The Life Sciences Graduate Program Integrative and Biomedical Physiology Masters Thesis Defense Report

Candidate's Name: _____

Graduate Program: _____

Thesis Exam Date: _____ Location: _____

This is to certify that _____ appeared before the undersigned committee on _____ and was given a Final Oral Examination for the Master of Science degree, the results being indicated below.

Master's Thesis Exam Committee Members:

Exam Outcome: It is agreed that the candidate:

Passed _____ unanimous decision
_____ divided decision

Failed The committee recommends that another examination:
_____ be given
_____ not be given

Evaluation of the Candidate's general scholarly attainment on the examination by each member of the committee (check one and sign your name in the space provided):

Superior Above Average Average Below Average Fail _____
Superior Above Average Average Below Average Fail _____
Superior Above Average Average Below Average Fail _____
Superior Above Average Average Below Average Fail _____

Comments (required if student failed the exam):

Dissenting members who prefer to do so are invited to present their comments to the Program Chair(s) by letter or in person.

Signature of Committee Chair

Date

Appendix V

GRADUATE STUDENT RESOURCE GUIDE

LionPATH (<http://www.registrar.psu.edu/lionpath/features.cfm>). LionPATH is Penn State's student information system, which provides students with access to their academic, registration, and financial records. Students can enroll for classes, view/accept their financial aid awards, and view their tuition bills.

Huck Graduate Student Advisory Committee (HGSAC) is a newly formed organization for support and career development for all HUCK students. http://www.huck.psu.edu/content/graduate-program/career_professional_development/graduate_student_advisor_committee

International Student Services provides answers to questions and needs that are unique to international students. The office is located at 410 Boucke Building. <http://global.psu.edu/>

Graduate Student Association (GSA) is the representative body for all graduate students. The GSA addresses issues of concern to graduate students and elects members to sit on shared-governance bodies of the University. The GSA also organizes social events for graduate students. <http://www.clubs.psu.edu/up/gsa/>

The Office of Student Aid is a good place to begin the search for financial assistance. <http://www.psu.edu/studentaid/>

The Office for Disability Services provides information and assistance to students with disabilities. <http://www.equity.psu.edu/ods/>

The Writing Center is sponsored by the Graduate School and provides assistance to graduate students who wish to enhance their writing skills. Graduate students are invited to schedule appointments for one-on-one discussions of their writing projects. <http://pwr.la.psu.edu/resources/graduate-writing-center>

Penn State Escort Service is operated under the auspices of Police Services and will provide an escort for students walking on campus after dark. The escort service may be reached at 5-WALK (865-9255). <http://www.psu.edu/dept/police/escortservice.html>

Off-Campus Housing opportunities are listed in 213 HUB-Robeson Center, 865-2346. <http://studentaffairs.psu.edu/offcampus/>

Office of Judicial Affairs is responsible for dealing with violations of the Code of Conduct including sexual assault, harassing, stalking, and physical assault. The phone number is 863-0342. <http://studentaffairs.psu.edu/conduct/>

The Code of Conduct is available at <http://studentaffairs.psu.edu/conduct/codeofconduct/>

The Affirmative Action Office is committed to ensuring the University maintains an environment free of harassment and discrimination. <http://www.psu.edu/dept/aaoffice/>

HUB-Robeson Center is the site for multiple student services including restaurants, a copy center, a bank (Penn State Federal Credit Union), STA Travel, a convenience store, the Penn State Bookstore, the Center for Arts and Crafts, Art Galleries, and the main information desk for the University. <http://studentaffairs.psu.edu/hub/>

Counseling and Psychological Services (CAPS) can help students resolve personal concerns that may interfere with their academic progress, social development, and satisfaction at Penn State. Some of the more common concerns include difficulty with friends, roommates, or family members; depression and anxiety; sexual identity; lack of motivation or difficulty relaxing, concentrating or studying; eating disorders; sexual assault and sexual abuse recovery; and uncertainties about personal values and beliefs. <http://studentaffairs.psu.edu/counseling/>

Career Services, located in the MBNA Career Services Building, is fully equipped to assist graduate students in the preparation of resumes and curriculum vitae and in developing effective interviewing skills. Career Services hosts a career fair that is open to graduate as well as undergraduate students. <http://studentaffairs.psu.edu/career/>

Research Protections is the office that oversees all research on human participants, animals, radioisotopes and biohazardous materials. You must have permission from this office prior to conducting research involving any of these subjects. Permission can not be obtained after the work has begun. <http://www.research.psu.edu/orp/>

Pasquerilla Spiritual Center is home to more than fifty spiritual organizations. The center is non-denominational and provides students with opportunities to explore ethical and spiritual issues.
<http://studentaffairs.psu.edu/spiritual/>

Problem resolution

Graduate students occasionally have difficulties with their advisors, their programs or an academic matter associated with their programs. The first step in problem resolution is always to talk with your advisor and then with the program chair or department head and then the associate dean of your college. If satisfactory resolution remains elusive, the associate dean of the Graduate School is available to provide guidance and maintain neutrality. Issues discussed during meetings with the assistant dean will remain confidential if requested by the student. Appointments may be made by calling 865-2516. Please see

<http://bulletins.psu.edu/graduate/appendices/appendix2> for additional Graduate School policy details.

Academic Integrity

The University does not tolerate violations of academic integrity, which include but are not limited to: plagiarism, cheating, falsification of information, misrepresentation or deception. The complete policy is available at:

<http://www.psu.edu/oue/aappm/G-9-academic-integrity.html>

Plagiarism

Plagiarism is often a confusing concept. At Penn State, plagiarism means taking someone's words and presenting them as your own. Cutting and pasting from a web site is considered plagiarism. Copying verbatim from any source without using quotation marks and the full reference is plagiarism. Plagiarism is a serious violation of academic integrity regardless of whether it is a homework exercise, an exam, a thesis, or a manuscript for publication.

University policies may be viewed on line. Important policies include:

Sexual Harassment (AD41)

Professional Ethics (AD47)

Parking Rules (BS04)

Intellectual Property (RA11)

<http://www.guru.psu.edu/policies/>

Graduate Student Policies are available on line

These include:

Grade mediation (G-10)

Resolution of problems (Appendix II)

Termination of program (Appendix III)

Termination of assistantship (Appendix IV)

Residency requirements (Appendix V)

<http://www.gradschool.psu.edu/current-students/student/>

Medline

All students should be proficient in this research resource database. Through the extensive Penn State Library system <http://www.libraries.psu.edu/>, students can learn how to use this free on-line reference retrieval system.

Contact the reference desk librarians at <http://ask.libraries.psu.edu/?stream=8>.

Appendix VI

Key Personnel Contacts

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This publication is available in alternative media on request.

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