

Environmental Health Sciences

2017-2018 PhD Student Handbook

Version 06.20.2017

James T. Laney School of Graduate Studies
Emory University



EMORY

L A N E Y
G R A D U A T E
S C H O O L

TABLE OF CONTENTS

1. Contents

1. Contents	i
Contact Information	1
2. Program Overview	2
3. Program Competencies	3
4. Program Requirements.....	6
a. Overview	6
b. Curriculum	6
c. Teaching Assistant Training and Teach Opportunity Program (TATTO).....	8
d. English as a Second Language (ESL) Program	10
e. Research Rotations.....	10
5. Dissertation Research.....	11
a. Dissertation Committee	11
b. Qualifying Examination.....	11
c. Written exam guidelines	14
d. Oral defense guidelines.....	15
e. Dissertation Format.....	16
f. Final Defense of the Dissertation Research.....	16
g. Publication Guidelines	16
h. Electronic Dissertation Submission	16
i. Admission to Candidacy	17
6. Registration / Select LGS Policies.....	19
a. Tuition, Assistantships, and Fellowships.....	19
b. External Funding.....	19
c. Student Fees	19
d. Employment.....	19
e. Registration	19
f. Credit Hour requirements	20
g. Registration Requirements per Semester	Error! Bookmark not defined.
h. Drop/Add	20
i. Course Waivers.....	20
j. Leaves of Absence	20
k. Grades	20
l. Academic Performance.....	21

m.	Student Due Progress	21
n.	Annual Report	23
o.	Completion of Degree and Graduation Process	23
p.	Master's of Science in Environmental Health Sciences	23
7.	Grievance Policy	24
8.	Academic Calendar	25
9.	Research Rotation Forms	26
10.	Course Enrollment/ Registration Request Form	29
11.	Curriculum	30

Contact Information

Department of Environmental Health

<https://www.sph.emory.edu/departments/eh/index.html>

Emory University James T. Laney School of Graduate Studies:

<http://www.gs.emory.edu/>

Director of Graduate Studies (DGS):

Jeremy A. Sarnat, Sc.D.

jsarnat@emory.edu

(404) 712-9725

Program Administrator:

Ariadne Swichtenberg, MSW

Ariadne.swichtenberg@emory.edu

(404) 727-7905

This information is in addition to the Laney Graduate School Policies and Handbook, available here: <http://www.gs.emory.edu/academics/policies/index.html>

2. Program Overview

The goal of the doctoral program in Environmental Health Sciences at Emory University is to provide students with interdisciplinary training to better understand the impact of the environment on human health and disease. Students have a wide range of unique opportunities for research and education through the participating departments across campus and the numerous health agencies affiliated with the program. Further, the program aims to produce a unique cadre of future leaders in the field of environmental health sciences who have expertise in both laboratory- and population-based research. Our graduates will be competitive for positions in academia, government and private industry.

The doctoral program is administered through the James T. Laney School of Graduate Studies (LGS) and follows the rules and procedures set forth by the LGS. For a complete guide of the LGS policies and procedures, please see the [LGS Handbook](#). The program is managed by the Department of Environmental Health in the Rollins School of Public Health.

Research

The faculty members of the Environmental Health Sciences Program utilize a wide range of tools to address problems central to the field, including exposure assessment, toxicology, disease ecology, and environmental epidemiology. Faculty research interests include infectious diseases, cardiovascular diseases, cancer, development, neurological disorders, and the impact of climate change on human health and disease. Several departments in multiple schools participate in the program making this a truly University-wide program. For example, within the Rollins School of Public Health, the following departments are participating: Environmental Health, Epidemiology, Global Health, and Biostatistics and Bioinformatics. The Departments of Environmental Sciences and Biology within the College of Arts and Sciences and the Departments of Medicine, Pharmacology, and Pediatrics within the School of Medicine are represented.

Advisors

The Director of Graduate Studies (DGS) will serve as the Faculty Advisor for all first year students. During the first year, students will complete three research rotations after which they will identify a Faculty Advisor to oversee their dissertation research. The DGS and Faculty Advisor serve as a resource for progress through the program, including course selection and dissertation topic. The Faculty Advisor will become the Dissertation Committee Chairperson. Both the DGS and Program Administrator assist with general course and program advisement, including communication of related LGS policies.

3. Program Competencies

Upon graduation, our students will have received comprehensive training in the following areas. These competencies will serve as the foundation of the program and provide a template for the comprehensive exams.

1) Exposure Science- Students will be able to assess the presence and fate of chemical and microbiological contaminants in the environment and their impact on human exposures. This competency will include training in environmental chemistry, environmental microbiology, environmental exposure assessment and the use of exposure biomarkers.

Students will learn basic theory behind and practical methods for sampling and analysis of chemical and microbiological contaminants in environmental (air, water, soil, food, etc.) and biological media (exhaled air, blood, urine, etc.). A central objective of this competency is the thorough understanding of applied field sampling techniques for characterizing environmental contaminants across various media and human exposure pathways. Students are trained in direct methods of assessment, including source and microenvironmental sampling, bioassays and other techniques, as well as indirect methods including the use of modeling and questionnaire surveys. Students are trained in laboratory analysis methods of field samples and in the interpretation of the laboratory data, including analytical quality control/quality assurance procedures and evaluation of the uncertainties associated with these data. Students will be expected to be able to communicate their results to a public health audience and apply the techniques within a human health effects setting.

2) Biological Mechanisms of Susceptibility and Disease- Students will be able to assess the impact of environmental insults on human health. This competency is focused on mechanisms of toxic action and impacts on human physiology.

The goal of this competency is to provide the student with a basic understanding of human physiology, factors that affect vulnerability to chemical exposures and infectious agents, and pathophysiological consequences and assessment (biomarkers) of such exposures. Historically, many of these concepts have been taught under the rubric of toxicology, but are generally more focused on chemical exposures. Since environmental exposures can also include such things as infectious agents, allergens, particulate matter, and mold toxins, it is necessary to broaden the scope for our students. This knowledge is important for understanding why certain populations, such as children and the elderly, may exhibit increased vulnerability to environmental hazards.

3) Environmental Determinants of Population Health- Students will be able to assess the impact and risk of various environmental exposures on human populations (from small clinical populations to large general populations).

This component focuses on how environmental exposures impact human health on a population level, including proximal exposures to environmental toxins and infectious agents, as well as distal environmental determinants like climate change, the built environment and environmental reservoirs of infectious disease. Epidemiologic studies of environmental exposures are considered, including an understanding of the quality of exposure assessment required to convincingly

demonstrate exposure-disease relationships. Risk assessment, which integrates data on external exposure, internal dose, and disease, will be stressed, including the potential policy implications and cost benefit issues. Advanced and emerging risk assessment tools are emphasized, including air and water dispersion models, statistical competency in geospatial and mathematical modeling, remote sensing and environmental forecasting.

Competencies with Required Course Grid

PhD in Environmental Health Sciences (University-wide program, based in Environmental Health) Competencies	Learning Experiences												
	EHS 780R: Research Design and Management	EHS 710: Advanced Laboratory and Field Methods in Exposure Science	EHS 715: Advanced Environmental Epidemiology	EHS 740: Molecular Toxicology	EHS 750: Public Health Ecology	EHS 760: Advanced Risk Assessment	EHS 721: Problem Based Learning in Environmental Health Sciences	EHS 722: Problem Based Learning in Environmental Health Sciences	EHS 600R: Research Rotations	EHS 796R: Research Credit	TATT 600: TATTO Summer Course	TATT 605/610: Teaching Assistantship/Associateship	EHS 797R: Dissertation
Utilize advanced methods in exposure assessment of environmental contaminants		X					X	X	X	X			
Interpret advanced methods in exposure assessment of environmental contaminants		X					X	X	X	X			
Describe mechanisms of toxic action and how physiological and other factors can modify effects of environmental toxicants				X			X	X	X	X			
Advanced epidemiological methods to examine associations between environmental factors and disease			X				X	X	X	X			
Use risk assessment tools to describe the risks associated with various environmental exposures						X	X	X	X	X			
Design novel research projects to examine key challenges in field	X		X			X	X	X	X	X			X
Identify the ethical issues involved in the responsible conduct of research	X		X		X	X	X	X	X	X			X
Teach graduate course content in environmental health sciences	X						X	X	X	X	X	X	X
Disseminate research findings in multiple formats	X						X	X	X				X

4. Program Requirements

a. Overview

To successfully complete the doctoral program in Environmental Health Sciences, students must complete the following program requirements:

- Curriculum/Required Courses
- Teaching (Teaching Assistant Training and Teaching Opportunity Program - TATTO)
- Research Rotations
- ESL Program (*International Students Only*)
- Laney Graduate School Jones Program in Ethics (JPE)
- Written Qualifying Examination
- Oral Qualifying Exam that includes a presentation of the proposed dissertation topic
- Dissertation, consisting of:
 - Written dissertation document
 - Final oral defense of the dissertation

b. Curriculum

To satisfy curriculum requirements, students must complete the GS credit hour requirements and the Environmental Health Sciences coursework requirements. The programmatic coursework requirements are based upon the Competencies.

The required classes provide students with a foundation in the core competencies. The elective coursework is meant to provide the student with expertise within a given area of study as it relates to Environmental Health Sciences. See the full Curriculum in the appendix and in the EH Department Blackboard site.

Required courses may be waived if students have learned the concepts in coursework taken prior to entering the program. This is determined on a case-by-case basis upon consultation with the DGS and Program Administrator when the student first enters the program.

Prerequisite Coursework/Foundation Courses

Foundation coursework is required to gain the required knowledge and prerequisites for the required courses. Students entering with an MPH will likely have most of these courses or equivalent content; otherwise, students are expected to take the following foundation courses:

<u>Class</u>	<u>Credit Hours</u>
BIOS 500 Statistical Methods I and Lab	4
BIOS 501 Statistical Methods II and Lab	4
EH 520 Human Toxicology	3
EH 540 Environmental Hazards I	2
EPI 530 Epidemiologic Methods I and Lab	4
EH 530 Environmental and Occupational Epidemiology	2

Related Links:

LGS Academics: <http://www.gs.emory.edu/academics/index.html>

RSPH Enrollment Services:

<http://www.sph.emory.edu/rollins-life/enrollment-services/index.html>

RSPH Course Catalog: <http://www.sph.emory.edu/academics/catalog/index.html>

RSPH “Internal Schedule” (shows all semester course listings, times, and any special rules).

<https://www.sph.emory.edu/rollins-life/enrollment-services/2016-fall-internal/index.html>

Be sure to cross-reference the rules and prerequisites with the Course Catalog.

Environmental health courses and syllabi:

<http://www.sph.emory.edu/academics/courses/eh-courses/index.html>

c. Teaching Assistant Training and Teach Opportunity Program (TATTO)

The requirements for completion of the TATTO program are:

1. Teaching Assistant Training Course (TATT 600)

This is a two-day course taught in the late summer. This course must be taken before students can receive credit for their teaching assistantship or teaching associateship. The syllabus covers syllabus writing, grading, lecturing, discussion facilitating, the using writing as a pedagogical tool, conducting of lab sessions, and the use of new technologies. Though this course occurs in the summer, it appears on the student transcript as a fall course.

2. Teaching Assistant (TATT 605)

Students assist faculty in teaching Environmental Health courses. Responsibilities include: developing and grading homework, holding problem and review sessions, providing individual help to students through office hours, and other duties deemed necessary by the instructor. As a general rule, courses outside the Department of Environmental Health will not fulfill the TATT 605 requirement.

3. Teaching Associate (TATT 610)

Students co-teach with an instructor by collaborating in the development and teaching a defined portion of a course. Teaching Associates take more responsibility for syllabus development, course content, lectures and student evaluation than in 605. While it is preferred that this requirement will be fulfilled through Department of Environmental Health courses, non-EH department courses may be requested/discussed with the DGS for consideration.

See the following page for a list of courses that fulfill the TATTO requirements. The Department requires that students receive permission from the DGS, Program Administrator, and course instructor prior to committing to a TATTO 605 and 610 position. Complete the form at the link below. Your TA class will be confirmed before the end of each semester's pre-registration period.

Procedure for requesting a TA Position (605, 610, and non-TATTO):

Students must complete the request form located here by November 1 for spring classes and March 15 for fall: <http://goo.gl/forms/6roqE2VWIA>

All EHS students are expected to fulfill one semester of TATT 605 before candidacy and one semester of TATT 610 prior to graduation. Students who have completed their TATTO requirements may TA above and beyond these requirements for payment at an hourly rate. *Students may work a maximum of 10 hours per week outside their regular classwork and research if the DGS and faculty advisor grant permission.* The TATTO requirements must first be met to TA for an hourly wage. To ensure the DGS and program administrator are aware of EHS students TA's in this situation, complete the form at the link above. For more details about TATTO requirements, serving as a TA, and working outside/above and beyond TATTO requirements, see the Laney Graduate handbook.

Classes that will typically fulfill TATTO 605 and 610 requirements include:

Fall:

EH 500* Perspectives in Environmental Health
EH 520 Human Toxicology
EH 524 Risk Assessment
EH 550 Environmental and Occupational Health Practice
EH 582 Global Climate Change
EHS 747 Advanced Environmental and Occupational Epidemiology
GH 560 Monitoring and Evaluation

Spring:

EH 500* Perspectives in Environmental Health
EH 510 Foundations of Exposure Science
EH 530 Occupational and Environmental Epidemiology
EH 548 Research Methods for Water and Health
EH 549 Critical Analysis of Water, Sanitation, and Hygiene Research
EH 570 Environmental and Occupational Health Policy
EH 571 Global Environmental Health Policy

*Suitable for 605 only.

Other EH/EHS courses may occasionally become available.

Non-EH courses may be discussed with the DGS for consideration.

d. English as a Second Language (ESL) Program

International students only

All international students must participate in mandatory English assessment sessions. Students that do not meet the minimum assessment requirements must participate in oral and written English communication classes directed by the Graduate School.

The ESL curriculum consists of three courses:

1. Intermediate Pronunciation/Communication
2. Advanced Pronunciation/Communication
3. Graduate Writing

Required for continuation in Graduate School, these courses carry 2 - 4 credit hours and are graded S/U. Courses appear on official transcripts.

e. Research Rotations

All students are required to complete *three* research rotations (between 8 weeks to an entire semester). The rotations generally occur during the student's first fall, spring, and summer semesters. Students register for EHS 600R (2 credits) in each semester the rotations occur. Students must complete the Research Rotation Form at the beginning of each research rotation and the Research Rotation Completion Form at the end of their rotation to fulfill their graduation requirement (see appendix). Three Research Rotations must be completed by the end of the first year summer semester. The student should work at least 15 hours/week during the semester under faculty supervision. Each rotation will be with a different faculty member and represent the three core competency areas: Exposure Science, Biological Mechanisms of Susceptibility and Disease, and Population Health (this is not a one-to-one requirement; some rotations may combine two of the areas). The goal is for the student to gain experience in a real research setting. Each rotation should include development of a research problem, collection/analysis of data, and a laboratory report. It is also an opportunity to develop a relationship with faculty and explore and develop dissertation research ideas.

5. Dissertation Research

Students are encouraged to begin exploring research topics once they matriculate into the program. The DGS and EHS program faculty will help to guide the student in this search. The doctoral dissertation must meet the requirements of the Environmental Health Sciences Program and the Graduate School. In particular, the dissertation must demonstrate independent and creative thought in Environmental Health Sciences. Typically, the student will publish the dissertation work as 2-3 peer reviewed manuscripts. As indicated in the LGS catalog, "the dissertation must make an actual contribution to existing knowledge or be a fresh and significant critical interpretation of existing knowledge."

Dissertation research involves elements of hypothesis formation, study design, analysis, interpretation and summarization. A student should be involved in data acquisition specific to the hypothesis under question. For laboratory-based projects, the student must be the primary generator of data. Only in rare instances will students be allowed to utilize secondary datasets for their dissertation research and only as a complement to a larger body of work.

a. Dissertation Committee

Student's research is to be supervised by a committee of advisors. The committee must consist of at least five qualified individuals. At least three of the members must be within the Environmental Health Sciences Program with representation from laboratory and population based faculty. It is suggested that students discuss potential committee members with the DGS before asking the faculty member. The DGS will review the composition of the dissertation committee after the student's submission of the "Dissertation Committee Form" <http://www.gs.emory.edu/academics/policies/candidacy.html>.

b. Qualifying Examination

Also see *LGS Candidacy and Dissertation website*:
<http://www.gs.emory.edu/academics/policies/candidacy.html>

Passing the EHS qualifying examination is a condition for advancement to candidacy. The qualifying examination consists of a written dissertation proposal, a written take-home exam, and an oral defense. Each student will have her own qualifying exam committee. The qualifying exam committee has four examiners and one observer:

Examiners (4)

- Three members of the dissertation committee [the student's dissertation advisor is ineligible]. The student, based on advice from her advisor, will select these three examiners.
- One Environmental Health Sciences (EHS) faculty who is not a part of the dissertation committee. This will likely be someone from outside the student's primary research area. Members are selected by the Director of Graduate Studies (DGS), not by the student or dissertation advisor. The DGS is ineligible to fill this role.

Observers (1)

- The student's dissertation advisor.

The student, in consultation with his or her dissertation advisor, may select the three dissertation committee members who will be examiners at any time during the program, and he or she is expected to consult with these members during the writing of the dissertation proposal. The examiner who is not part of the dissertation committee will be identified by the DGS shortly after the dissertation proposal has been submitted.

Step 1. Dissertation proposal

The first step in the qualifying examination is the submission of the written dissertation proposal, which describes the research question and the research activities that will comprise the student's dissertation. The format of the dissertation proposal will be specified by the student's dissertation advisor. The proposal must include a review of the relevant literature, a description of the specific research activities that will comprise the dissertation, and a discussion of how the dissertation will make a significant contribution to the field.

The proposal must be submitted no later than the second-to-last business day in August (in the summer after the student has completed their required coursework). This is a final deadline; many advisors expect their students to submit proposals several months before this deadline. Proposals will be submitted electronically to the DGS and to the student's dissertation advisor. Receipt of stipend support during the following academic year is contingent on meeting this deadline. Extensions will be granted only in exceptional circumstances. The student will ensure his or her dissertation advisor is satisfied with the dissertation proposal before submitting the final version to the DGS.

Step 2. Written exam

Shortly after the dissertation proposal submission, the DGS will determine the remaining qualifying exam committee member and will forward the student's proposal to the examiners of the qualifying exam committee. The four examiners will read the dissertation proposal; should the majority feel the proposal is unsatisfactory, then the student will fail the qualifying examination. Failing the exam at this stage should be reserved for situations when the proposal has major deficiencies, e.g., for incomplete proposals.

Providing the proposal is deemed satisfactory by the examiners, a mutually agreeable date will be selected to administer a three-day take-home written exam and oral defense. As a general scheduling guideline, the oral defense should occur within two weeks of the written exam due date, but it should not take place during the same work week the written exam is due.

The four examiners on the qualifying exam committee create the content of the written exam. After reading the student's dissertation proposal, each examiner will submit questions for the written exam. Two types of questions are permitted:

- *Exam questions:* Questions submitted by the examiner on which the student is to be

evaluated. As the exam is open-book, questions will be synthetic and open-ended. The number of questions will vary from one examiner to the next; however, each member will be instructed to develop a set of questions that are pertinent to the dissertation proposal that can be satisfactorily addressed in a two-and-a-half page response.

- *Clarification questions:* Questions the examiner has about specific proposal details. The examiner will be instructed to ask such questions sparingly, and the DGS will ensure the student is not burdened with an undue number of clarification questions. Responses to these questions will be short and directly to the point. The student will not be formally evaluated on their responses to these questions.

Exam questions will be vetted by the other members of the exam committee before being sent to the student. The completed exam will be submitted, electronically, to the DGS and to all examiners on the student's dissertation qualifying exam committee no later than 72 hours after the exam is provided to the student. Formatting requirements are 11 point font, 1 inch margins, and maximum length of 10 pages. References and responses to the clarification questions are not counted against the 10 page limit.

Step 3. Oral defense

The oral portion of the qualifying exam is a defense of the student's proposed doctoral research. All five members of the qualifying exam committee should be present. The exam is not open to the public.

The oral qualifying exam is a 60 minute question and answer session with the committee that begins with a 10 minute overview by the student of the research question and dissertation objectives. The student can expect to receive questions related to specific points in the proposal as well as on more general aspects of the subject area of the proposal, such as basic principles, methodology, or the literature. The student will likely be asked to further elaborate upon and justify their answers to the written exam as well. One of the examiners who is familiar with EHS oral defense procedures will act as the procedural chair of the exam (guidelines described in the subsequent pages).

After the question and answer session has been completed, the student will leave the room and the qualifying exam committee members will discuss the merits of the written exam and the oral defense. The four examiners will collectively determine the outcome of the qualifying examination (as described in the guidelines). The written exam and the oral defense are graded together. The possible outcomes of the qualifying exam are pass, conditional pass, and fail.

Students who pass the oral portion of the qualifying exam will be eligible to progress into candidacy. Application for admission to candidacy is made by completing and submitting the form entitled, "Application for Admission to Candidacy, Doctor of Philosophy" to the LGS. Information and forms related to applying for candidacy can be found at:
http://www.graduateschool.emory.edu/resources/progress.php?entity_id=5

Students receiving a conditional pass will be required to complete remedial action to make up for deficiencies before being permitted to apply to PhD candidacy. Students who fail may be

dismissed from the program or provided with an opportunity to retake the qualifying exam, at the discretion of the DGS and a committee comprised of EHS program faculty.

Guidelines for the qualifying exam are as follows:

c. Written exam guidelines

- The goal of written exam is to test the following:
 - The student's ability to answer challenging, synthetic questions relevant to their dissertation research.
 - The student's ability to integrate information across the Environmental Health Sciences core disciplines (exposure science, biological mechanisms, and population health).
 - The student's depth of understanding in the core discipline of their primary focus.
- Although each examiner is entitled to develop questions as he or she sees fit, it will often be the case that the dissertation committee members are well-suited at testing depth of understanding within the core discipline, and that the EHS faculty member assigned by the DGS to the qualifying exam committee will be better-suited at testing the student's ability to integrate and synthesize information across the core disciplines.
 - Each examiner will develop a set of questions that can be addressed in two-and-a-half pages. There is no specific guidance on the number of questions. The student will have 10 pages (total) to answer the questions from the four examiners.
 - The four examiners will review the collection of submitted questions to ensure they are appropriate and not duplicative. When the final set of questions has been agreed upon they will be sent to the DGS.

The DGS will electronically send the questions to the student at the scheduled time.

Guidelines for the student

- The written exam is open book. You are not to consult with other people or receive outside help from any individual.
- The student will receive two sets of questions – the “exam” questions and a short set of “clarification” questions. The student will respond to both sets of questions, however only the responses to the “exam” questions will be graded. The student should answer the clarification questions as straightforwardly as possible.
- You may have the need to refer to previous literature when answering certain questions. Please provide the relevant citations in the text and a list of references.
- Formatting requirements are 11 point font, 1 inch margins, maximum length of 10 pages. The list of references are not counted against the 10 page limit, and responses to the clarification questions are not counted against the 10 page limit.
- Your completed exam is to be submitted electronically to the DGS and to the four examiners of the qualifying exam committee no later than 72 hours after you first received the exam questions.

d. Oral defense guidelines

Total exam time: 2 hours MAX

Student presentation: 10 minutes

Student examination: 60 minutes

Additional questions, advisor discussion, examiner discussion & grading: 20 minutes

- The goal of the oral defense is to test the following:
 - The student's ability to formulate and defend a worthwhile research project
 - The student's knowledge and understanding of the subject area of the proposal, pertinent literature and methodological issues.
- The student can be questioned on specific aspects of the proposed studies as well as on more general aspects of the subject area.
- The student can be questioned on subject areas in which weakness was demonstrated in the written qualifying exam or for which further elaboration was needed.
- Guidelines to the **student**:
 - You have a maximum of 10 minutes to give an overview of their proposal.
 - A timer will be provided and the student must strictly adhere to the 10 minute rule.

When the questioning is over:

- The procedural chair asks the student to leave the room.
- The procedural chair asks the mentor to describe his/her input into the proposal.
- Each examiner will assign an initial score for the exam, bearing in mind the following criteria:
 - The score should be on a continuous scale from 0 to 4.0, with 4.0 being the highest possible score – 1 decimal place only
 - The grade should reflect the examiner's assessment of both the written qualifying exam and the oral defense
 - The minimum passing grade is 3.0
 - Conditional Pass
 - Circle "Yes" or "No"
 - If conditional (e.g. on a rewrite of the paper, or some other assignment), they should denote the potential requirement
 - The ballot is anonymous
- The procedural chair will tabulate the ballots, and announce the result.
- The procedural chair will forward the results of the exam (pass, fail, or conditional pass) to the DGS as soon as possible after the exam.

The procedural chair will inform the student at the conclusion of the oral defense which of the following three categories they belong to: pass, conditional pass, or fail. Students receiving a conditional pass or who fail will also be informed of the date when they can expect to receive more information, and that they can speak to their mentors to get preliminary informal feedback.

Students who pass will receive no other direct information from the committee. Any communication about the exam to the students who pass will be informal via the mentor.

e. Dissertation Format

The format of the dissertation shall follow Emory University guidelines and shall include a number of chapters. Typically the first chapter consists of an introduction to the problem, the literature review, justification and rationale for the research. Students may write dissertations in a traditional form with separate, additional chapters for: methods, results, discussion and conclusions. However, we encourage students to include manuscripts that are suitable for publication in lieu of the results chapters. This may include three or more publishable papers. If the student and Dissertation Committee agree on the manuscript option, the dissertation would still need to include the introduction, literature review and justification before the manuscript section. After the manuscripts, two additional sections should be included: an overall discussion section including strengths, limitations and conclusions of the research project and a future directions section. Details of the dissertation format are negotiable with students' dissertation committee. The student must submit the complete written dissertation to his or her committee at least four weeks prior to the final defense.

f. Final Defense of the Dissertation Research

The Dissertation Committee Members will indicate to the student when the final oral defense of the dissertation research may be scheduled. An oral presentation shall be made to department faculty and students including a question and answer period. This public presentation is then followed by a closed-door session with the Committee. Questions and concerns may be raised at this time with the student present and revisions specified. The final discussion of approval is made by the Committee in the absence of the student. The Dissertation must also be approved by the Graduate School. Students must be registered for the semester they receive the degree.

g. Publication Guidelines

To prevent the order of authorship from possibly becoming a problem, this should be determined as soon as feasible, preferably as the study begins. The student should be first author (or co- first author) on publications of their dissertation research. The committee chair is generally senior author on all publications from the dissertation (this may be second or last, depending on the Chair's preference). Manuscripts should be reviewed and approved by all authors prior to submission for publication. Persons who have made contributions to the study that are not sufficient to merit authorship should be acknowledged. Those who are acknowledged should agree to be named. If unpublished work is cited as "personal communication" the individual who communicated the information should agree to have their work cited in this way.

h. Electronic Dissertation Submission

All EHS PhD students are required to submit their dissertation on-line through the Emory Electronic Dissertation (ETD) system. Information is located at <https://etd.library.emory.edu/>, the PhD Student blackboard site, and information is circulated by the ETD program each semester. Under the "Access Restriction" section, all EHS PhD students should select "6-year embargo" until further notice.

i. Admission to Candidacy

When a student receives a pass on the written and oral qualifying examinations, that student may become a candidate for the PhD degree upon recommendation of the student's Dissertation Committee Chair. To apply for admission to candidacy, complete the LGS form entitled "Application for Admission to Candidacy," obtain DGS signature, and submit to the EHS program administrator. Once the DGS and program administrator confirm all requirements have been met, the form will be returned to you to submit to the graduate school. Information and forms related to applying for candidacy can be found at:

<http://www.gs.emory.edu/academics/policies/candidacy.html>

For students matriculating into the EHS program prior to fall 2017

Application for admission to candidacy requires that all coursework, including 24 research hours and TATTO requirements have been met and receipt of a passing grade on both the written and oral qualifying examinations. Students must be admitted to candidacy at least one semester before applying for the degree.

The credit hour requirements vary depending on the student's education prior to enrollment in the program. Some of the required credit hours for the doctoral degree may be accepted as transfer credit from other institutions upon recommendation of the Department and approval of the Dean of the Graduate School, provided these credit hours have not been applied to another degree. In general, no more than 12 credits can be transferred.

Per LGS guidelines, to be eligible for candidacy, students must have earned 54 credit hours at the 500 level or above. Most EHS students entering the program with a master's degree will enter in advanced

For students matriculating into the EHS program in or after fall 2017

Application for admission to candidacy requires that all coursework, research rotations, JPE 600, JPE in-program requirements, and TATTO 600 and 605, have been met and receipt of a passing grade on both the written and oral qualifying examinations. Completion of the oral qualifying examination will include a defense of the dissertation proposal and satisfying the dissertation committee regarding the student's readiness to undertake the dissertation research. In addition, prior to submitting application to candidacy, students must resolve any Incomplete (I) or In Progress (IP) grades, and be in good standing with a minimum cumulative 2.70 GPA. TATTO 610 and JPE 610 may be completed after entering candidacy.

Timing

Students should enter candidacy as soon as all requirements have been completed. Students must reach candidacy by September 15 of their fourth year (i.e., at the start of their fourth year). Students who do not meet this deadline will be placed on academic probation, will not be eligible for PDS funds, and may forfeit financial support. These sanctions will be lifted when the student enters candidacy. Further details related to LGS candidacy procedures and forms for applying to candidacy can be found at:

<http://www.graduateschool.emory.edu/academics/policies/>

Procedure

Students enter candidacy by submitting the application to enter candidacy, available on the LGS website. The application requires programs to affirm that all program requirements have been met, and LGS affirms that remaining requirements have been met.

Students are considered “in candidacy” when the Dean has signed approved the application to enter candidacy.

6. **Registration / Select LGS Policies**

Visit the LGS website for a complete list of policies: <http://www.gs.emory.edu/academics/policies/index.html>

a. Tuition, Assistantships, and Fellowships

All doctoral students accepted into the Environmental Health Sciences program will receive funding either from the Laney Graduate School, the NIEHS Training Grant or faculty research funds.

Students must be registered as full-time students (9 credit hours/semester). Most students are responsible for the University activity, athletic, computer, mental health, and transcript fees before they reach tuition paid status; some training grants cover these fees. In years 4+, students are responsible for a reduced fee rate each semester.

After 8 years in Advanced Standing, tuition scholarships are no longer provided. If the student is granted an extension, he/she will be responsible for paying tuition until the approved graduation date.

b. External Funding

Students are encouraged to seek external funding for research projects through writing grants to federal or private agencies (e.g. NIH or EPA). Students who seek external funding should discuss their plans with their advisor and the department's grant specialist who can assist with navigating the Emory financial and OSP system. The DGS should also be informed of any grant submissions.

c. Student Fees

Before reaching tuition paid status, the student is responsible for the University student activity, athletic, computer, mental health, and transcript fees.

d. Employment

Pursuit of a doctoral degree is considered to be a full time activity. Students enrolled in the EHS doctoral program must request special permission from the DGS and the Associate Dean of Research before accepting any outside employment. To facilitate meeting this requirement, all students must submit information regarding any outside employment to the DGS and Program Administrator at the beginning of each semester via email.

e. Registration

Students will register for coursework after consultation with their DGS and/or faculty advisor and the Program Administrator each semester. Students must provide a completed Course Enrollment Form to the Program Administrator during each pre-registration period. Pre-registration begins in March for the following fall, in October for the following spring, and in

May for the summer. All students should be registered for 9 credit hours each semester. Below are select policies from the LGS Handbook; always refer to LGS for the most current policies.

f. Credit Hour requirements

To be eligible for candidacy, students must have earned at least 54 credit hours at the 500 level or above.

Students must be registered for a minimum of 9 credits each semester to maintain full-time status. During summer term, students *must* register full time (9 hours) for research credits and/or appropriate course work *or* for Graduate in Residence (RES 999 GSAS EHS).

g. Drop/Add

Students may change their course schedule through OPUS during add/drop period. This period usually occurs during the first five days after courses begin in the fall and spring semesters; check the academic calendar for specific dates. The Program Administrator can assist, especially when adding classes outside of EHS; provide your student ID and the class/course number as necessary.

h. Course Waivers

Students may petition the DGS to waive out of a required course if they can demonstrate they have sufficient knowledge in the subject matter. If approved, the student will be required replace those hours with electives. See the DGS for more information.

i. Leaves of Absence

A student in good standing may be granted up to two one-year leaves of absence upon recommendation of the DGS and approval of the Associate Dean for Research and the Dean of the Laney Graduate School. Students interested in taking a leave of absence should first contact the DGS. For additional information, see the LGS Handbook.

Returning After Leaves of Absence

Per LGS policy, a readmission form must be filled out by the student returning from a leave of absence. This may be done as early as the pre-registration period prior to the semester the student wishes to return, at least two weeks prior to registration.

j. Grades

Students may take coursework for a letter grade (A, A-, B+, B, B-, C, or F), S/U or Audit. Graduate students may not register for undergraduate level courses as auditors. Courses taken as audit credit do not count towards the 9 credit hours required for the semester or towards degree credit hour requirements.

Students must earn a grade of B- in all required program courses and Satisfactory in TATTO requirements. Students receiving below B- in a required course or Unsatisfactory for a TATTO requirement will be required to repeat the course. Students receiving a GPA of less than 2.7, a grade of F, U, IF, or IU in any course, two incompletes in a semester or an incomplete in one 9 credit hour course, will be put on academic probation by the Laney Graduate School. Read the academic performance section in the Laney Graduate School Handbook for more information.

All courses taken as audit, S/U, and/or outside RSPH require instructor permission and official enrollment in the course. If, upon consultation with their advisor, the student chooses enroll in a course with an alternate grading basis of audit or satisfactory/unsatisfactory (S/U) or register for a course outside RSPH, the student must first get permission via email from the course instructor. The email approval, with student ID number and course number, must be submitted to the Program Administrator for registration or grading basis assistance.

k. Academic Performance

The Laney Graduate School sets the minimum standards a student must meet for satisfactory academic performance. Programs may establish more stringent standards. The Laney Graduate School defines unsatisfactory academic performance as follows:

- A GPA in any semester of less than 2.7

- Receipt of a grade of F, U, IF, or IU in any course

- Receipt of two or more incompletes in a semester, or an incomplete in one 9 credit hour course

A student whose academic performance is deemed unsatisfactory will be placed on probation for one semester. During the probationary semester, the student must receive no failing grades, must reduce the number of incompletes on his or her record to one, and must attain a cumulative GPA of at least 2.7. During the probation, the student will not be allowed to take incompletes in any courses without permission from the Laney Graduate School. A student who fails to meet the above conditions will be placed on probation for a second semester. The Laney Graduate School will terminate a student who merits a third consecutive probationary semester unless the program provides written justification for the student's continuation and the Laney Graduate School grants approval.

Any student who meets the conditions of probation described above will be reinstated to good standing. The reinstatement happens automatically and the student will not be notified of the action. The DGS should discuss with the student the terms and conditions of probation and of reinstatement to good standing.

l. Student Due Progress

Students are expected to make continuing satisfactory progress towards graduation throughout their tenure in the doctoral program.

During coursework, due progress will be indicated by maintaining a GPA of 3.0 or higher in each semester, receiving no grade lower than a B- in any required course, taking no more than

one grade of incomplete in any semester, having no more than two grades of incomplete active at any point, and completing the research rotations during each semester (fall, spring, summer) of the first year.

Students will take the qualifying exam after their second year.

All students should expect to advance to candidacy within 3 months of completing their written qualifying examination. In addition to completing the written qualifying examination, advancing to candidacy includes:

- completion of TATT 600 and 605. TATT 610 must be fulfilled before graduation.
- completion of three research rotations
- completion of an oral qualifying examination. Completion of the oral qualifying examination will include a defense of the dissertation proposal and satisfying the dissertation committee regarding the student's readiness to undertake the dissertation research. This will include questions about the substantive area of the student's work and the application of the various approaches in environmental health sciences to the student's area of research and study design.

It is difficult to place a precise timetable for progress to graduation following completion of the oral qualifying examination because of variability associated with the specific dissertation research project. However, steady progress towards graduation should be maintained. Generally, students will be considered to be making due progress if their research has advanced in substantial, demonstrable ways over the past 12 months. Students are required to meet with their full dissertation committee annually and more frequent meetings are recommended.

At the beginning of each academic year, the faculty will evaluate each continuing student's academic progress over the previous 12 months. This evaluation will be based on information provided by the student and the advisor for the LGS Annual Report and information provided by the student as part of the annual research-in-progress abstract book.

Students who are determined to be making inadequate progress will be placed on probation. The DGS in collaboration with the Executive Committee will establish the terms and conditions of the probationary period, and the probation will be reevaluated each semester. At the end of the probationary period, the DGS will provide each student who is on probation with a written evaluation of their progress under probation. Students who meet the condition of their probation will be reinstated to good standing. The Program, rather than the Graduate School, will notify the student of this action. Students who have not met the condition of their probation will continue on probation for a second semester. Student who receive a third consecutive probationary semester (summer excluded) will be expelled from the program unless (1) the program provides written justification for the student's continuation and (2) the LGS approves.

While it is anticipated by most students will graduate in four-five years depending on background, students must complete all requirements for the PhD within eight years of admission to advanced standing. Extensions beyond this will be granted only under

extraordinary circumstances and as described in the Graduate School handbook.

m. Annual Report

Students are required to submit an annual report, usually due around May/June, to report on their previous year's activities, accomplishments, progress toward completion, and to set goals for the upcoming year. Student should include all EHS-related activities such as events and conferences attended (including title, date, location), presentations, rotations, TA positions, and publications.

n. Completion of Degree and Graduation Process

A student approaching the end of a degree program is responsible for ensuring that all departmental, Graduate School and University requirements are met. It is the student's responsibility to be aware of and to meet all deadlines. Failure to do so may result in failure to receive the degree until the following semester. Detailed steps for graduation are available at: <http://www.graduateschool.emory.edu/academics/policies/completion.html>

o. Master's of Science in Environmental Health Sciences

With approval from the EHS Doctoral Program Committee, a Master's of Science (MS) in EHS may be awarded. Either an interim MS may be awarded to recognize sufficient quantity and quality of scholarly work completed between a requisite BA/BS and PhD, or a terminal master's degree may be awarded when a student does not complete the doctoral degree. Decisions will be based on an assessment of the student's academic performance as well as the quantity and quality of research completed. The student will be required to complete a thesis, as well as comply with all other policies of the Laney Graduate School outlined in the Laney Graduate School Handbook.

7. Grievance Policy

Students with grievances related to some aspect of their program in Environmental Health Sciences should make efforts to initially address it with the Director of Graduate Studies (DGS). The student should describe the grievance and relevant details in a letter to the DGS, who will try, if possible, to resolve the grievance in conversation with the student and relevant parties. If this is not successful, the Director will appoint a committee, consisting of three EHS program faculty members (or faculty members outside EHS, if the situation warrants), as well as the acting president of the Public Health Doctoral Students of Environmental Health (PHDS-EH) student organization, who will review the grievance and propose an appropriate response. The committee will be structured to avoid any conflict of interest. If the DGS is involved with the particular case, then an initial letter should go to the Chair of the Environmental Health Department to review the grievance and appoint a committee. If the grievance involves the PHDS-EH president, the DGS will appoint a suitable replacement. If it is impossible to resolve the grievance within this committee or within the framework of the EHS administrative structure, or if the student wishes to appeal the decision of the committee, the DGS or Department Chair will forward the grievance to the Office of the Senior Associate Dean of the Laney Graduate School. From this point forward, the grievance will be handled according to the Grievance Procedure outlined in the Laney Graduate School Handbook (<http://gs.emory.edu/academics/policies/conduct.html>).

8. Academic Calendar

Also visit RSPH Enrollment Services for important dates:

<http://www.sph.emory.edu/rollins-life/enrollment-services/index.html>

Source: <http://www.registrar.emory.edu/Students/Calendars/index.html>

9. Research Rotation Forms

The Rotation Contract Form must be completed with the rotation faculty advisor and DGS and submitted to the Program Administrator prior to starting each rotation.

1. Complete and review the Contract Form with your site supervisor;
2. Enter the data into the database (<http://goo.gl/forms/xhwbl4Rpi0>);
3. Document approvals and submit to the Program Administrator (PA). Either
 - a. forward an email approval from site supervisor to the PA, or
 - b. submit an electronic/scanned/mailed or hard-copy of a signed Contract Form to the PA.

Please also try to obtain a quality photograph (or several) of you in your rotation physical location of you doing your work, as well as general EHS-related photographs of your work if possible. We hope to highlight students and their experiences on our website and other on publicity items.

The Rotation Completion Form must also be completed and submitted to the Program Administrator within 10 days of the rotation completion, preferably scanned and emailed; hard-copy will also be accepted.

Environmental Health Sciences Rotation Contract Form

Instructions: Complete this form with your supervisors/faculty advisor, obtain signatures, and enter the data into the web database (<http://goo.gl/forms/iff9RdCNVz>). The link is also on the EH Blackboard site – EHS – Rotations. Submit approval email or a hard-copy of this form with signatures to EHS Program Administrator.

Student Name:

Rotation # (circle one): 1 2 3

Semester and Year of Rotation:

Primary Competency Area of Rotation: Exposure Science Biological Mechanisms Evt. Determinants

Site Supervisor Name:

If not RSPH faculty, also list title, agency, email and phone number:

Please list any other faculty and/or mentors collaborating on this rotation:

Have you confirmed you are enrolled in EHS 600R Rotation for this semester?

Start Date: Anticipated Completion Date:

Number of hours per week:

Attach additional sheet with this information if you prefer.

Project Title:

Physical Location of Rotation:

Objectives (List at least three):

Anticipated Skills to Develop:

Potential Products (e.g. manuscripts, presentation, grant submission):

Does this rotation involve primary (original) data collection? If so, describe what activities you will be involved with related to data collection (e.g. developing survey instruments, interviewing respondents, etc.).

Please obtain at least one photo of you at your rotation site to submit with your completion form (in high resolution).

Student Signature: _____ **Date:** _____

Rotation Faculty Signature: _____ **Date:** _____

DGS Signature: _____ **Date:** _____

This form must be submitted to EHS Program Administrator (Ariadne Swichtenberg) within 10 days of completing your rotation.

Environmental Health Sciences
Rotation Completion Form

Student Name:

Rotation # (circle one): 1 2 3

Semester (check OPUS to ensure you were enrolled for EHS 600R):

Completion Date:

Total number of hours completed:

Briefly discuss what was accomplished during this rotation and what you found to be a particularly valuable experience:

What skills did you develop?

Are there any products of this rotation (e.g. manuscripts, presentation, grant submission)?

If this rotation involved primary data collection, describe the activities you were involved with related to data collection (e.g. developing survey instruments, interviewing respondents, etc.).

Submit at least one photo of you at your rotation site and submit electronically with your completion form (in high resolution).

Student Signature: _____ **Date:** _____

Rotation Faculty Signature: _____ **Date:** _____

DGS Signature: _____ **Date:** _____

This form must be submitted to EHS Program Administrator (Ariadne Swichtenberg) within 10 days of completing your rotation.

Environmental Health Sciences PhD Curriculum 2017

11. Curriculum

EHS Required Courses

Course #	Title	Semesters Offered	Suggested Year	Credits	Semester Taken
Integrated Research Skills					
Biostatistics: It is assumed students have taken BIOS 500 and 501. If not, you must enroll in BIOS 506 and 507. At least one additional BIOS course is required for everyone. Work with the DGS to determine which course is right for you. Suggestions are below.					
<i>BIOS 500 or equivalent and BIOS 501 or equivalent</i>	<i>Statistical Methods I and Lab</i>	Fall	1	4	
	<i>Statistical Methods II and Lab</i>	Spring	1	4	
OR: BIOS 506 and BIOS 507	Biostatistical Methods I (Prereq: College-level courses in Linear algebra and Calculus, SAS programming experience or concurrent enrollment in BIOS 531: SAS Programming.)	Fall	1	4	
	Applied Linear Models (Prereq: BIOS 506 or equivalent; 1 yr of calculus, linear algebra, and matrix algebra)	Spring	1	4	
Plus one more BIOS course, such as :					
BIOS 502	Statistical Methods III (Prereqs: BIOS 500 and BIOS 501)	Fall	2	2	
BIOS 505	Statistics for Experimental Biology	Spring	2	4	
BIOS 526	Modern Regression Analysis (Prereqs: BIOS 507 or instructor permission)	Fall	2	3	
BIOS OTHER					
Sub-total:				8-12	
EHS 600R	Research Rotation	Fall, Spring, Summer	1	2	1. 2. 3.
EHS 777R	Problem-Based Learning in EHS	Every other Spring (odd yrs)	2	2	
EHS 790R	Research Design & Management	Fall, Spring*	Fall & Spr 1 & 2	1	1. 2. 3. 4.
EHS 798R	Pre-candidacy Research	Fall, Spring, Summer	2+	1-12	1. 2. 3. 4.
EHS 799R	Dissertation Research (Only students in candidacy may enroll in EHS 799R.)	Fall, Spring, Summer	3+	1-12	1. 2. 3. 4.

*Can take after qualifying exams.

Environmental Health Sciences PhD Curriculum 2017

Course #	Title	Semesters Offered	Suggested Year	Credits	Semester Taken
EHS 701	Translational and Interdisciplinary Public Health Research	Fall	1	1	
JPE 600	Program for Scholarly Integrity Core Course	Fall (August 1-day course)	1	0	
Sub-total:				Up to 29	
Biological Science					
<i>EH 520</i>	<i>Human Toxicology</i>	Fall	1	3	
EHS 740	Molecular Toxicology (Prereq. EH 520 or instructor permission)	Spring	2	3	
Sub-total:				3-6	
Exposure Science					
EHS 710	Advanced Laboratory & Field Methods in Exposure Science	Spring	1 or 2	2	
Sub-total:				2-4	
Population Science					
<i>EH 524</i>	<i>Risk Assessment I</i>	Fall	2	2	
<i>EPI 530, 530L</i>	<i>Epidemiologic Methods I with Lab</i>	Fall	1	4	
<i>EH 530 or</i>	<i>Environmental & Occupational Epidemiology</i>	Spring	1	2	
<i>EPI 534</i>	<i>Epidemiologic Methods II with Lab</i> (Prereqs: BIOS 500 and BIOS 501 (or equivalent), and EPI 530. BIOS 501 may be taken concurrently)	Spring	1	3	
Sub-total:				0-9	
Teaching					
TATT 600	TATTO Training	Fall (2 days in August)	1 or 2	1	
TATT 605	Teaching Assistantship – Enroll under EHS	Fall, Spring or Summer	1 or 2	2	
TATT 610	Teaching Associateship – Enroll under EHS	Fall, Spring or Summer	2	2	
Sub-total:				5	
Electives					
Total Credits				48+	

Environmental Health Sciences PhD Curriculum 2017

Suggested/Sample Sequence

<u>COURSE NUMBER</u>	<u>COURSE NAME</u>	<u>CREDITS</u>
FALL 1		
BIOS 506	Biostatistical Methods	4
EHS 600R	Research Rotation	2
EHS 790R	Research Design & Management	1
EHS 701	Translational and Interdisciplinary Public Health Research (S/U Grading Basis)	1
JPE 600	Program for Scholarly Integrity Core Course (1 day course)	0
TATT 600	TATTO Summer Course (2 days in August) (or take in year 2)	1
Elective(s)	Elective(s) of your choice – DGS may help with selection	2+
Semester Sub-total:		9+
If not already taken in a master's program, the following may also be required:		
<i>EH 520</i>	<i>Human Toxicology</i>	3
<i>EH 540</i>	<i>Environmental Hazards I</i>	2
<i>BIOS 500</i>	<i>Statistical Methods I and Lab</i>	4
<i>EPI 530</i>	<i>Epidemiologic Methods I and lab</i>	4
Semester Total:		9+
SPRING 1		
BIOS 507	Applied Linear Models	4
EH 530 <i>or</i>	Envt. & Occ. Epidemiology (Prereq: EPI 530)	2
EPI 534	Epi. Methods II with Lab (also take EHS 747 in fall)	3
EHS 600R	Research Rotation	2
EHS 710	Advanced Laboratory & Field Methods in Exposure Science	2
EHS 790R	Research Design & Management	1
TATT 605	Teaching Assistantship (or in year 2)	2
Semester Total:		9+
SUMMER 1		
EHS 600R	Research Rotation	2
EHS 798R	Pre-candidacy Research	7
FALL 2		
TATT 600	TATTO Summer Course (2 days in August) <i>if not already done in fall 1</i>	2
TATT 605	Teaching Assistantship <i>if not already done in yr 1</i>	2
EHS 790R	Research Design & Management	1
EHS 798R	Pre-candidacy Research	1-12
Electives	Electives	2+
If not already taken in a master's program, the following may also be required:		
<i>EH 524</i>	<i>Risk Assessment</i>	2
Semester Total:		9+

Environmental Health Sciences PhD Curriculum 2017

<u>SPRING 2</u>		
EHS 760	Advanced Risk Assessment	2
EHS 740	Molecular Toxicology	3
EHS 777R	Problem-Based Learning in EHS*	2
EHS 790R	Research Design & Management	1
EHS 798R	Pre-candidacy Research	1-12
TATT 610	Teaching Associateship	2
Electives	Electives	
Semester Total:		9+
<u>SUMMER 2</u>		
Comprehensive Exams		
EHS 798R	Pre-candidacy Research	9
<u>FALL 3</u>		
EHS 799R	Dissertation Credits	
		12
<u>SPRING 3</u>		
EHS 799R	Dissertation Credits	
		12
<u>SUMMER 3</u>		
RES 999	In Residence	12

*Will change years depending on when offered.

Must be enrolled a minimum of 9 credits to be full-time

Environmental Health Sciences PhD Curriculum 2017

Suggested Electives

Students are free to choose electives in advanced coursework other than those listed below with approval from the DGS.

GDBBS (IBS courses): <http://staging.web.emory.edu/gdbbs-internal/students/course-listing.html>

RSPH (EH, EHS, EPI, BIOS, GH courses): <http://www.sph.emory.edu/academics/catalog/index.html>

<u>Dept.</u>	<u>Number</u>	<u>Title</u>	<u>Semester</u>	<u>Credits</u>
BAHS	502	Human Physiology	Fall	4
BIOS	737	Spatial Analysis of Public Health Data	Spring (occasional)	2
EH	547	Introduction to Microbial Risk Assessment (also GH 506)	Spring Break	1
EH	582	Global Climate Change: Health Impacts and Response	Fall	2
EH	583	Spatial Analysis in Disease Ecology	Fall	4
EH	590R	Computational Systems Biology: Modeling Biological Responses	Fall	2
EH	590R	Topics in Health; Genome, Exposome, and Health	Spring	2
EHS	747	Advanced Environmental Epidemiology (also EPI 747)	Fall	2
EHS	760	Advanced Risk Assessment	Spring	2
EPI	738	Advanced Epidemiologic Methods I	Spring	2
EPI	533	Programming in SAS	Fall, Spring	1
EPI	566	Vaccines and Immunization	Spring	2
EPI	739	Advanced Epidemiological Methods II	Fall	2
EPI	740	Epidemiological Modeling	Fall	3
EPI	743	Epidemiology of Cancer	Fall	2
EPI	761M	Introduction to Clinical and Translational Research Medicine	Occasional	
GH	518	Emerging Infectious Disease	Spring	2
GH	591N	Antibiotic Resistance	Occasional	
IBS	505	Human and Molecular Genetics		
IBS	506R	Basic Mechanisms of Neurological Diseases	Spring	4
IBS	513	Virology	Spring	2
IBS	531	Introduction to Molecular & Systems Pharmacology I	Fall	4
IBS	536	Drug Metabolism and Toxicology	Spring	2
IBS	542	Concepts in Immunology	Fall	4
IBS	555	Basic Biomedical & Biological Sciences	Fall	6
IBS	556	Principles of Basic Biomedical and Biological Sciences II	Spring	6
IBS	591	Population Biology and Evolution of Disease	Spring	4
IBS	595	Ecology	Fall (Odd years)	4
IBS	717	Neuropharmacology		
IBS	769R	Foundations of Disease Ecology		

Environmental Health Sciences PhD Curriculum 2017

Check on the Enrollment Services webpage for course schedules and permissions:
<http://www.sph.emory.edu/rollins-life/enrollment-services/index.html> (under the class catalog/semester schedule)

- Check the course catalog for pre-requisite requirements.
- If a course is permission only, contact the course department's ADAP or instructors for permission, then email the permission to the EH ADAP to register you.
- Complete CITI Training Certificate (via IRB website: <http://www.irb.emory.edu/>)
- Provide EH ADAP with certificate of completion

Must be enrolled a minimum of 9 credits to be full-time.