Program in Epidemiology and Human Genetics
Student and Faculty Handbook
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Purpose of this Document

These guidelines are intended to supplement the regulations of the Graduate School of the University of Maryland, Baltimore and the Graduate Program in Life Sciences. All students are strongly encouraged to study and observe the policies described in the Graduate School’s most recent graduate catalog and on their website (http://www.graduate.umaryland.edu), and on the GPILS website (http://lifesciences.umaryland.edu). Regulations and expectations described in this handbook are specific to the Program in Epidemiology and Human Genetics.

A Message from the Director and Track Leaders

We hope that you will have a rewarding academic career as a graduate student in the Program in Epidemiology and Human Genetics, and we are here to support your success as a member of the University of Maryland, Baltimore community. To that end, we want to ensure that you have access to the policies and regulations that pertain to you as a student. If you have further questions after reviewing these guidelines, we encourage you to come and speak with us.

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Program Description

The Program in Epidemiology and Human Genetics at the University of Maryland, Baltimore, is an inter-disciplinary program of study leading to an M.S. or Ph.D. degree. This program combines biomedical, clinical, and human genetics studies with opportunities to learn and apply biostatistical, molecular, and genomics tools. The Ph.D. Program consists of three tracks: Epidemiology, Molecular Epidemiology, and Human Genetics and Genomic Medicine, each with a tailored curriculum of study. The M.S. Program consists of tracks in Epidemiology and Preventive Medicine, Clinical Research, and Human Genetics and Genomic Medicine. The Dual Degree Programs include dual degrees with Gerontology and Pharmaceutical Health Services Research. The Dual Degree Programs enable students to earn a Master’s degree in Epidemiology and Preventive Medicine while earning a Ph.D. degree in Gerontology or Pharmaceutical Health Services Research. For more information on the program and tracks, please visit our website using the following link: http://lifesciences.umaryland.edu/epidemiology/default.aspx.

The Ph.D. Track in Epidemiology allows students to acquire advanced knowledge, skills, and experience in completing independent epidemiological research in a biomedical setting. This track has a strong quantitative focus, necessary for providing students with the tools needed to conduct world-class research on epidemiologic questions, and to participate in multidisciplinary research in a broad range of specialties.

The Ph.D. Track in Molecular Epidemiology is designed for students who wish to undertake research that combines molecular, genetic, and epidemiologic techniques and to apply these technologies to the understanding of risk factors for disease transmission or acquisition. Students in this track are provided with a solid knowledge base in epidemiology and biostatistics, while also gaining the laboratory and informatics skills needed to incorporate genomic data into their research.

The Ph.D. Track in Human Genetics and Genomic Medicine provides broad training for students wanting to understand human genetic variation and its relation to health and disease. Students first receive an overview of human genetics (molecular, biochemical, clinical, cytogenetics, and genetic epidemiology/genomics) and then specialize in their particular areas of interest.

The M.S. Track in Epidemiology and Preventive Medicine provides coursework and research experience for individuals seeking public health careers in academia or industry settings, hospital administration, health departments, regulatory agencies or international organizations.

The M.S. Track in Human Genetics and Genomic Medicine is designed for students contemplating careers in human genetics, especially as it relates to health and disease. This track includes course work, seminars, and supervised research.

The M.S. Track in Clinical Research is designed specifically to meet the needs of the clinician or clinician-in-training by providing a combination of course work and research experiences needed for a successful career in clinical investigation. A total of 36 credits are required for the degree. Students may select from multiple concentration areas: epidemiologic research, patient-oriented research, outcomes/health services research, human genetics and research ethics.

Dual Degree Options

The Program in Epidemiology and Human Genetics offers a dual Master’s degree for students enrolled in the Gerontology and Pharmaceutical Health Services Research doctoral programs in which the doctoral students may simultaneously earn a Master’s degree in Epidemiology and their Ph.D. degrees.


Expectations

Expectations of Advisors for M.S. and Ph.D. Students
Upon entering the graduate program, students are matched to an academic advisor based on common research interests. Students later identify a research advisor who mentors them through their Master’s thesis or doctoral dissertation project. The initial academic advisor may become the thesis or dissertation advisor, but this is not always the case.

The role of the academic advisor is to serve as a resource for students on academic matters such as assimilating into the program, course selection, identifying prospective rotations, and choosing a research topic and thesis or dissertation advisor. Specific expectations and guidelines for student advising are provided below.

Time Commitment and Availability
The academic advisor should have regular contact with the student(s) he or she is advising. At minimum, advisors should meet with advisees once per semester.

Advisors should also be available for student questions during the semester in person or by email or telephone.

Course Planning and Selection
The academic advisor should assist the student with course selection and planning. Course descriptions and requirements for the various tracks can be found on the GPILS website (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx).

Student Progress
Advisors should be familiar with the student’s timeline and milestones so that they can provide guidance and assess the student’s progress in courses, rotations, and identification of a research topic and advisor. The steps to completing M.S. and Ph.D. degrees are detailed throughout this handbook.

The advisor should review the student’s grades after each semester. Grades will be provided by the academic office, but if not received, should be requested by the advisor. Many classes have prerequisites that include having performed satisfactorily in previous courses, and advisors should assure that students are meeting these requirements.

Assistance in Identifying Rotations and Research Advisors
Many students, especially those not familiar with our department or campus, will be unaware of possible opportunities for research rotations. The advisor should help the student focus his or her interests and suggest possible opportunities or faculty members who could serve as rotation mentors and/or research advisors.
**Expectations of Students**

As a student in the Program in Epidemiology and Human Genetics, you are part of a professional community of scientists. Your training will provide numerous opportunities for scientific collaboration and personal interaction with other scientists both within and outside of the program. Following are expectations for conduct that apply to all members of our community, including students. Adhering to these expectations promotes a productive and positive experience for all team members.

**Professionalism:**
- Maintain a high level of professionalism at all times in terms of communication, behavior and dress.
- Treat all faculty, staff and fellow students with respect.
- Keep your physical surroundings clean and in order. If you are sharing space (e.g., classrooms) or equipment (e.g., computers) with other individuals, always leave the area neat, clean and secured.
- Communicate concerns about the program in a respectful and professional manner.
- Check Blackboard regularly for important course related information.

**Responsiveness:**
- All important campus related email will be sent to your University of Maryland account. Reply promptly to email from faculty and administrative staff.
- Notify program director, track leader, academic coordinator, course instructors, and mentors if there is a change in your email address or other contact information.
- Post a vacation message when you will be away from your email for more than 24 hours.
- Respond promptly to requests for information.
- Promptly complete your annual progress report, review it with your advisor, and submit it before the deadline.

**Attendance:**
- Attend scheduled classes, meetings, departmental seminars and journal clubs.
- Inform instructors if you must miss a class.
- Arrange weekly schedule and vacation schedule with your rotation (or research) mentor.
Policies and Procedures

Policies and Procedures for all Graduate Students

M.S. Programs
The M.S. tracks follow standard Graduate School performance requirements with regard to minimum grade point average, continuous enrollment, time to degree and academic integrity. Students in the M.S. tracks are required to maintain a cumulative grade point average of 3.0 on a 4.0 scale. Students must register every fall and spring semester, unless on an approved Leave of Absence. A Leave of Absence must be approved by the student’s advisor and the program director. All requirements for the M.S. degree must be completed within five years from the first semester of admission. All students are expected to meet the highest standards of integrity. For further details, please visit the Graduate School website on Academic Performance and Progress in Master of Science Programs at http://www.graduate.umaryland.edu/catalog/academic_performance_master.html.

Ph.D. Programs
The Ph.D. tracks follow standard Graduate School performance requirements with regard to minimum grade point average, continuous enrollment, time to degree, advancement to candidacy and academic integrity. Students in the Ph.D. Program are required to maintain a cumulative grade point average of 3.0 on a 4.0 scale. Students must register every fall and spring semester, unless on an approved Leave of Absence. A Leave of Absence must be approved by the student’s advisor and the program director. Ph.D. students must be admitted to candidacy within five years of the first semester of enrollment and at least two full semesters before graduation. All students are expected to meet the highest standards of integrity. For further details, please visit the Graduate School website on Academic Performance and Progress in Ph.D. Programs at http://www.graduate.umaryland.edu/catalog/academic_performance_phd.html.

Registration
All graduate students are responsible for registering for classes each fall and spring semester unless a Leave of Absence has been approved. There are several steps to the registration process:

- Students should schedule a meeting with their academic advisor at least 8 weeks before the start of each fall and spring semester.
- During the meeting, students should discuss with their advisor the courses that they intend to take during the upcoming semester. Academic advisors should sign off on the student’s course registration request form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx) to indicate their approval of the desired course work.
- Student registration through the online registration system is locked by default. Once the academic advisor has approved the course work for the following semester, a course registration request form should be submitted to the academic coordinator. Registration will then be unlocked.
- Students must log on to the Student User Friendly System (SURFS) website (http://simsweb.umaryland.edu/) to complete the registration process at least 6 weeks before the start of the semester. Instructions detailing this process will be sent to student university email accounts. Please note that if a student has an outstanding balance with Student Accounts, he or she will not be able to register.

Course Evaluations
Please take the time to complete evaluations for each course that you take every semester. Your feedback and input are valued. Grades will not be released until students have completed course evaluations on Blackboard at the end of each semester. Instructions for how to complete evaluations will be emailed to students and posted on Blackboard.
Transferred Credits
No more than 6 course credits can be transferred to the degree. Students must have taken such courses from an accredited institution no more than five years before applying for admission to the program. Permission to transfer credit will be given in consultation with the student’s academic advisor(s), the program director and with the approval of the instructor of the course for which transferred credit is requested.

Credit cannot be transferred for courses that were used to fulfill requirements for another degree for correspondence courses or for “credit by examination” courses taken at other universities. Only courses in which the student received a grade of “B” or better are eligible for transfer. A request for transfer of credit form (http://www.graduate.umaryland.edu/documents/TRANSFER%20CRDTS.pdf) should be completed by the end of the student’s first semester. The current UM course master, the student’s advisor and the program director must approve the requests. Requests are to be submitted to the academic coordinator. Official transcripts of the courses for which credit is requested must accompany the transfer request forms. When a request for transfer of credit from another institution is approved by the Graduate School, the credits, but not the grades will be transferred.

Course Waivers
A maximum of 6 credit hours can be waived. For the M.S. and Ph.D. degrees in Epidemiology, the following courses cannot be waived:
- PREV 600 Principles of Epidemiology
- PREV 659 Observational Studies in Epidemiology
- PREV 747 Research Practicum I and 748 Research Practicum II

The instructor of the course to be waived has responsibility for assessing the student’s knowledge of the material and for approval of the waiver. Approved requests for course waivers must be in writing and on file in the academic office. Exceptions to this policy may be granted only with the approval of the program director, and are made on a case-by-case basis. Permitting a student to waive courses does not reduce the total number of credits required for the M.S. degree. For the Ph.D. degree, the required credits are reduced.

Elective Credit
Any course that is not included on the approved list of electives which a student, in consultation with his or her academic advisor, would like to take to fulfill elective credits for a degree, requires the approval of the program director. Approved epidemiology electives (http://lifesciences.umaryland.edu/epidemiology/epi_electives.aspx), molecular epidemiology electives (http://lifesciences.umaryland.edu/epidemiology/molecular_epi_electives.aspx) and human genetics electives (http://lifesciences.umaryland.edu/epidemiology/human_genetics_req.aspx) are posted on the GPILS website and can be found on page 16 of this handbook. Any student who would like to take an elective course offered outside of the department must obtain the program director’s signature on the course registration request form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx) before submitting it to the academic coordinator.

Independent Study
Students may develop independent study courses with members of program faculty for a maximum total of 6 credits. The signed independent study proposal form must be filed in the academic office prior to the start of the semester in which the course will take place. The form can be found on the GPILS website (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx).

Non-degree Coursework
The non-degree status is for students seeking to enhance their knowledge by completing one or more graduate courses, but who are not pursuing a degree. Should the student subsequently be admitted to the program, there is no assurance that credits earned as a non-degree student will be transferred. In cases where the program does grant such a request, no more than six credits will transfer to the degree.

Withdrawal from Classes
It is possible to withdraw from any class during the first three weeks of the semester without indication of the attempted course on the student’s transcript. Anyone wishing to withdraw from a class after the first three weeks must obtain the program director’s signature before submitting a course withdrawal form (http://www.graduate.umaryland.edu/documents/courses/CourseWithdrawal.pdf) to the Graduate School. Unless there
are extenuating circumstances, students in academic difficulty will not be permitted to withdraw after the first three weeks of instruction have passed. Full tuition refunds are only available for courses dropped on the first day of instruction. Please see the Graduate School’s website for further details: http://www.graduate.umaryland.edu/grad_calendar/index.html

Academic Misconduct
Fabrication, falsification, plagiarism, cheating, improprieties of authorship, facilitating academic dishonesty or any other type of academic misconduct will not be tolerated. Students pursuing a Ph.D. or M.S. degree in the Epidemiology and Human Genetics Program are expected to maintain academic integrity and honesty at all times. Please refer to the Graduate School policies regarding academic misconduct at http://www.graduate.umaryland.edu/policies/misconduct.html. The M.S. and Ph.D. Programs in Epidemiology and Human Genetics follow Graduate School policy in dealing with instances of academic misconduct.

Course Grade Appeal Procedure
The Graduate School provides students with a mechanism for reviewing course grades alleged to be arbitrary or capricious. If a student receives a grade that he or she feels does not reflect performance in the course, information at the following link should be carefully reviewed: http://www.graduate.umaryland.edu/policies/policy_grading.html. This procedure is followed by the M.S. and Ph.D. Programs in Epidemiology and Human Genetics.

Ombuds Committee
The Ombuds Committee was created by the Graduate School for the purpose of resolving disagreements between a graduate student and the graduate program with which he or she is involved. The M.S. and Ph.D. Programs in Epidemiology and Human Genetics encourage students to use the mediation services of the Ombuds Committee if they become involved in a dispute that cannot be successfully resolved at the program level. A step-by-step list of procedures for utilizing the Ombuds Committee can be found at http://www.graduate.umaryland.edu/policies/ombuds.html.

Appeal of Academic Dismissal
The M.S. and Ph.D. Programs in Epidemiology and Human Genetics abide by Graduate School policies for appeal of academic dismissal, which can be found at http://www.graduate.umaryland.edu/policies/appeal.html.

Preparing for Graduation
At least 6 months before a student plans to graduate, he or she should consult the Graduate School website (http://www.graduate.umaryland.edu/grad_calendar/index.html) for the current forms and deadlines. For clarification on any of the information provided, please call the Graduate School at 410-706-7131. Note that students must be registered for at least one credit in the period during which he or she plans to graduate, including summer and winter semesters. All Ph.D. students applying for graduation must have registered for an overall total of at least 12 doctoral dissertation research credits (PREV 899) and must have completed a successful Dissertation Defense. It is the responsibility of the student to provide the academic coordinator with copies of all forms submitted to the Graduate School.

Additional Policies and Procedures for Ph.D. students receiving GRAs
As first year graduate research assistants, students are expected to attend class, participate in seminars and Journal Club and perform research rotations. By the end of the first year, students should have chosen a mentor and research facility in which to pursue dissertation work. After 18 months, students will be expected to be supported by a mentor and thus should discuss with him or her time expected to be devoted to GRA activities, sick time, vacation time, etc. As stated in the Graduate Assistant Policies and Guidelines (http://www.graduate.umaryland.edu/documents/graduate%20assistantship/GA%20Guide%202012-2013.pdf), students are not eligible for vacation or sick leave. However, mentors have their own policies which may allow such flexibility. The granting of these benefits is at the discretion of the mentor.
Doctoral Student Funding
Students in the program can receive financial support through several mechanisms, including graduate research assistantships (GRAs) awarded by the university, training grant funds, research grant funds, employer funding, or self-funding.

GRA support includes tuition, stipend and health insurance and is available through the Graduate School only for the first three semesters. On March 1st of the student’s second year in the program, students with GRA support must transition to another source of funding and the research mentor or a training grant takes over funding the GRA—tuition, stipend and health insurance. Thus, by no later than March 1st of the second year, all students should have transitioned to a source of funding for their dissertation research and should be working actively to develop their dissertation research projects.

Regardless of funding source, during research rotations and later when working on dissertation projects, students are expected to devote 100% of their time and effort not spent on coursework into their research. In most cases, all the work that students do in their rotations is directly related to their dissertation and academic development. However, in some cases, a GRA-funded student is assigned up to 20 hours per week of work by the rotation or dissertation mentor that is not necessarily related to his or her progression toward a degree. For further information about this policy, see the Graduate Assistant Guide found at http://www.graduate.umaryland.edu/documents/graduate%20assistantship/GA%20Guide%202012-2013.pdf.

Tuition Remission and Payment by Grant Forms
During the first 18 months, graduate research assistants are responsible for completing and submitting tuition remission forms (http://hr.umaryland.edu/benefits/tuition_remission_process.htm) to the Graduate School each fall and spring semester. Copies of completed forms must be submitted to the academic coordinator at least 6 weeks before the start of the semester. It is important that these forms be submitted on time. Late forms result in account holds and registration problems.

Once a student is being funded by a mentor, they must have the mentor’s administrator complete the tuition remission form with an account code in box 17, and then have the mentor or the mentor’s administrator sign off on the form. This must be done each fall and spring semester. Completed forms must be submitted to the academic coordinator at least 6 weeks before the start of the semester for which tuition remission is requested. In addition, a payment by grant form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx) must be completed in order for the student to receive health insurance coverage. Please note that students must register for classes to generate a bill before completing the payment by grant form because the form requires an insurance amount from the student’s bill. These forms must be completed and submitted to the academic coordinator at least 6 weeks before the start of the semester.

Graduate research assistants must register as full-time students to remain eligible for stipend, tuition remission, and health insurance benefits each semester that they hold an assistantship. Tuition is remitted for 20 credits combined for fall and spring semesters. All students who receive a GRA must also register for 7 credits of ABGA 900 in each of the fall, spring and summer semesters. These credits do not count against the 10 credits for which tuition will be remitted. Tuition for the summer semester is not covered according to the Graduate School’s policy. All other fees and auxiliary benefits are the responsibility of the graduate student.
Research Rotations

- **Purpose:** Research rotations provide students with opportunities to 1) learn how to function and flourish in a research setting; 2) identify an area of research that the student will pursue for his/her dissertation work; 3) identify a source of funding for the student’s dissertation work; and/or 4) learn a specific skill (e.g., laboratory technique, statistical method) necessary for the dissertation work.

- **Time Commitment:** All PhD students (regardless of the source of their funding) perform research rotations during the first year of the GRA. For students in the Epidemiology or Molecular Epidemiology Tracks, there are two six month rotations. The first rotation takes place from September 1 to February 28, and the second takes place from March 1 to August 31 of the student’s first year in the program. The selection of the first rotation is made during the spring and summer preceding the student’s first year in the program. The selection of the second rotation is made during the last two months of the first rotation. In some cases, students may obtain permission to begin their rotations earlier, e.g., July 1. Students in the Human Genetics and Genomic Medicine Track will have three rotations, each 8-12 weeks in length, with duration and weekly schedule to be negotiated with the rotation mentor. In the first six months of the student’s second year in the Program, he or she will begin to work with a research mentor identified for dissertation research, or will begin a third rotation that offers another research opportunity or allows the student to obtain a specific set of skills. All Ph.D. students are expected to work on their research rotation projects full time except for the time spent on coursework (also see Doctoral Student Funding section below).

- **Expectations and Opportunities:** Rotations are a time of learning and growth, and the more time and energy students put into them, the more benefits they will reap in terms of new knowledge and expanding research and career opportunities. During the rotations, students work on projects that are mutually beneficial to the mentor and student. The student gains by learning new skills, techniques and ways of thinking; the mentor’s research is enhanced by student observations and input. Students will maximize the benefits of their rotations if they 1) agree upon a project and expectations with their mentor at the outset; 2) pay careful attention to what’s going on in the research setting regarding his or her specific project and in general; 3) work hard; 4) work independently, but 5) ask questions when they need help; 6) read, read, read, both readings recommended or assigned by the mentor and those obtained through inspired literature searches; and 7) maintain regular communication with the mentor to discuss all that he or she is finding and learning along with challenges and pitfalls that inevitably arise when one is engaged in research.

- **Selection Process:** The selection of rotations is made by the student in collaboration with the student’s advisor and the track leaders or program director. The selection is based on the individual student’s needs. Thus, students who have already identified their area of interest are encouraged to arrange rotations with one or more mentors in the identified research area who are likely to have research grant funds or training grant funds to support the student’s future dissertation work. Students who do not yet have a preferred research area are encouraged to identify rotations with one or more mentors who work in fields of potential interest and who are likely to have research grant funds or training grant funds to support the student’s future dissertation work. All students may choose, with the consent of their advisor and the appropriate track leader, to do one rotation whose goal is to learn a specific skill.

- **Form Submission:** Once a rotation has been selected, the student fills out a research rotation proposal form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx) in collaboration with the rotation mentor, outlining the goals of the rotation. The form is reviewed, signed by the student’s academic advisor and the appropriate track leader, and submitted to the academic coordinator. (Electronic signatures are sufficient as long as confirmation emails are sent to the academic coordinator.). At the end of each rotation, the student and mentor each submit to the academic advisor and track leader an evaluation in which they assess the extent to which the goals were attained. The academic coordinator must also receive the completed research rotation completion form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx).
Requirements

Journal Club and Seminar Requirements
Journal Club and departmental seminars provide additional educational opportunities for students. All M.S. and Ph.D. students should attend seminars and Journal Club on a regular basis.

EPH Bi-Weekly Grand Rounds
The series is planned by a faculty committee who will distribute announcements in advance of each seminar. All seminar dates, times and locations are posted under the Events tab on the GPILS website (http://lifesciences.umaryland.edu/pages/news.aspx). Students are expected to attend 60-80% of departmental seminars. Attendance sheets will be provided. Be sure to sign in as attendance will be recorded and taken into consideration during the annual review of the student’s progress.

PPGM Seminar Series
The Program in Personalized and Genomic Medicine sponsors this seminar series, which meets monthly and features an invited speaker. All HGEN students are expected to attend. All seminar dates, times and locations will be posted on the GPILS website (http://lifesciences.umaryland.edu/pages/news.aspx) under the Events tab.

HGEN 608 Human Genetics Seminar
All HGEN students are expected to attend and participate in HGEN 608 Human Genetics Seminar weekly every semester, regardless of whether or not they are enrolled and presenting during that semester. All seminar dates, times and locations will be posted on the GPILS website (http://lifesciences.umaryland.edu/pages/news.aspx) under the Events tab.

HGEN Journal Club
The HGEN Journal Club meets bi-weekly (usually every other Tuesday at noon) during the school year and is planned by an advanced HGEN PhD student under the guidance of a faculty sponsor. Announcements are distributed in advance of each seminar. All HGEN Ph.D. and MS students, plus interested Epidemiology students are expected to attend, and most will be drafted to present. All seminar dates, times and locations will be posted on the GPILS website (http://lifesciences.umaryland.edu/pages/news.aspx) under the Events tab.

EPH Journal Club for M.S. and Ph.D.
EPH Journal Club meets weekly during fall and spring semesters on Mondays at noon. Articles should be posted by the presenter on the Journal Club Blackboard site (https://localbb.umaryland.edu/webapps/portal/frameset.jsp) the week before they will be presented. All Journal Club meetings will be posted on the GPILS website (http://lifesciences.umaryland.edu/pages/news.aspx) under the Events tab.

The Journal Club serves several important purposes: 1) it provides an opportunity for faculty and graduate students to interact as colleagues and discuss stimulating research papers; 2) it provides an educational opportunity for students to gain skills in presentation, obtain experience reading and critiquing scientific papers and have a chance to hear diverse viewpoints from faculty and other students; and 3) it helps students and faculty keep abreast of major developments in epidemiology, preventive medicine and public health.

M.S. students are expected to present once per year and attend 90% of Journal Club meetings. M.S. students in the Residency Program are expected to present twice per year and attend 90% of Journal Club meetings. Ph.D. students in their first two years of study are expected to present once per year and attend 80% of Journal Club meetings. Ph.D. students beyond their second year of studies are expected to mentor and guide a new student through the preparation and presentation process once per year.

Teaching Assistant Requirement (Ph.D. Students in the Epidemiology/ Molecular Epidemiology Tracks only)
Student teaching is an important activity that serves to improve the instructional quality of courses taught in the department and provides practical training for Ph.D. students in university-level teaching. Ph.D. students become eligible to assume teaching assistant (TA) responsibilities starting in the spring semester of their second year. Students who desire TA work earlier may be permitted to do so. Ph.D. students are expected to spend approximately five hours per week during each semester performing teaching assistant duties.
TA Assignment Procedure

1. In spring of each year, faculty members who will teach courses in the following academic year will send their request for TAs to the academic coordinator. (Faculty members are encouraged to specify a preference for a student TA or approach a student to inquire about his or her availability to be a TA during the desired semester.)
2. The academic coordinator will assign TAs as requested and inform faculty and students via email.
3. If the availability of TAs is larger than the number of TAs needed for a given semester, students may be excused from serving for that semester, based on seniority or extenuating circumstances.
4. To serve as TA for a course, a student must have previously taken the course or be exempt from taking the course based on previous knowledge.

TA Responsibilities

Duties may include, but are not limited to:

1. Grading homework, exams, quizzes and projects
2. Holding office hours/consultation sessions
3. Leading laboratory, discussion, recitation or review sessions
4. Guest lecturing
5. Planning activities including contacting guest speakers, organizing course materials, or developing assignments and review materials
6. Providing support for web-based courses

Faculty Responsibilities

1. Faculty are expected to ensure that TA activities do not take more than five hours per week, on average, to perform.
2. Faculty are expected to provide a TA environment in which the student learns university-level teaching skills, e.g., course planning and development, lecturing, course management, etc.
3. Faculty are encouraged to creatively incorporate TAs into their courses to enhance the learning experience of students in the course.

Notes: The requirement for students admitted prior to fall 2007 is to participate for one semester in a departmental course as a teaching assistant or lab instructor. The TA requirement may be modified to accommodate students with extenuating circumstances.

Original Data Collection Requirement (Epidemiology and Molecular Epidemiology Ph.D. Tracks)

Because of the importance in epidemiologic research of collection of primary data, the student will be required to document that such experience has been obtained. The experience may be obtained as part of a research rotation or other research involvement, but may not be obtained in a formal course or involve academic credit. Students must submit a detailed description of the original data collection experience to the academic coordinator for review by track leaders and program director. The data collection form can be found at http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx. The chair of the dissertation committee will determine when this requirement has been met; approval of the program director is required.

Coursework

A summary of the required courses for the Epidemiology/Molecular Epidemiology and the Human Genetics and Genomic Medicine tracks are provided in the following two tables. Subsequent tables in the following sections on progression to the Ph.D. and M.S. degrees provide examples of typical curricula for PhD and MS students during years 1 and 2.
<table>
<thead>
<tr>
<th>Course Title</th>
<th>When Offered</th>
<th>Credits</th>
<th>M.S. Regular</th>
<th>M.S. Residency</th>
<th>M.S. Clinical Research</th>
<th>Ph.D. Epidemiology</th>
<th>Ph.D. Molecular Epidemiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREV 600 Principles of Epidemiology</td>
<td>Fall/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>616 Introduction to Clinical Investigation at UMB</td>
<td>Summer/A**</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>617 Writing a Clinical Research Grant</td>
<td>Summer/A</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>619 Introduction to SAS</td>
<td>Fall/A</td>
<td>1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>620 Principles of Biostatistics</td>
<td>Fall/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>633 Application of Legal and Regulatory Issues in Clinical Research</td>
<td>Fall/A</td>
<td>1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>648 Health Services Policy, Management and Finance</td>
<td>Summer &amp; Fall/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>659 Observational Studies in Epidemiology</td>
<td>Spring/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>668 Environmental/Occupational Health</td>
<td>Fall /A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>706 Research Informatics: Data Management in Clinical Research</td>
<td>Winter/A (4 day course)</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>716 Chronic Disease Epidemiology</td>
<td>Summer/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>711 Genetic Epidemiology</td>
<td>Spring/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>GPLS 716 Genomics and Bioinformatics</td>
<td>Spring/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PREV 720 Statistical Methods in Epidemiology</td>
<td>Spring/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>721 Regression Analysis (half-semester course)</td>
<td>Fall/A</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>723 Survival Analysis (half-semester course)</td>
<td>Fall/A</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>747 Research Practicum I</td>
<td>Spring/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>748 Research Practicum II</td>
<td>Summer/A</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>749 Infectious Disease Epidemiology: A Global Perspective</td>
<td>Fall/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>758 Health Survey Research Methods</td>
<td>Fall/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>780 Molecular Epidemiology</td>
<td>Fall/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>801 Longitudinal Data Analysis</td>
<td>Spring/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>802 Statistics for Molecular Biology (half-semester course)</td>
<td>Spring/ B</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>803 Clinical Trials/Experimental Epidemiology</td>
<td>Fall/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PH 610 Foundations of Public Health</td>
<td>Fall/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CIPP 907 Responsible Conduct of Research</td>
<td>Fall/A</td>
<td>1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Molecular Biology course</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
</tr>
<tr>
<td>Human Physiology course</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
<td>(✓)</td>
</tr>
<tr>
<td>ELECTIVE CREDITS</td>
<td>12 non-thesis / 6 thesis</td>
<td>4</td>
<td>15 non-thesis / 14 thesis</td>
<td>7-8 (minimum)</td>
<td>11 (minimum)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONCENTRATION COURSEWORK CREDITS</td>
<td>N/A</td>
<td>N/A</td>
<td>Optional</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESEARCH CREDITS</td>
<td>6 (optional)</td>
<td>N/A</td>
<td>6 (optional)</td>
<td>12 (minimum)</td>
<td>12 (minimum)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL CREDITS REQUIRED FOR DEGREE</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>56</td>
<td>56</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Key:
A= Annual  B= Bi-annual
✓ Required course
*  Students must select three of the four courses marked with an asterisk.
** Introduction to Clinical Investigation at UMB is a weeklong course that meets from 9am-4pm, usually the first week in August.
*** Clinical Research students have an option to complete Research Practicum I and II or to complete a Master’s thesis and register for PREV 799.

1 A background in Human Genetics is required as prerequisite.
2 A prior molecular biology course is required for students in the Molecular Epidemiology track, and is a prerequisite for PREV780.
3 A course in human physiology is required for students with non-biomedical backgrounds.

Note: Epi track students who entered the program prior to Fall 2010 are not required to take Chronic and Infectious Disease Epi courses. Molecular Epi track students who entered the Program prior to Fall 2010 are not required to take Molecular and Genetic Epi courses. Instead, any two of the following substantive courses can be taken: Chronic Disease Epi, Infectious Disease Epi, Injury Epi, Environmental and Occupational Disease Epi, Cancer Epi, Epi of Aging, Molecular Epi and Genetic Epi.
### Epidemiology and Human Genetics
**Degree Requirements for MS and PhD in Human Genetics and Genomic Medicine**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>When Offered</th>
<th>Credits</th>
<th>M.S.</th>
<th>Ph.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGEN 601 Basic Human Genetics I</td>
<td>Fall/A</td>
<td>4</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>HGEN 602 Basic Human Genetics II</td>
<td>Spring/A</td>
<td>4</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>HGEN 608 Human Genetics Seminar</td>
<td>Fall &amp; Spring/A</td>
<td>1</td>
<td>2X+</td>
<td>4X+</td>
</tr>
<tr>
<td>HGEN 718 Laboratory Rotations</td>
<td>Fall &amp; Spring/A</td>
<td>1</td>
<td></td>
<td>3X</td>
</tr>
<tr>
<td>PREV 619 Introduction to SAS &amp; PREV620 Principles of</td>
<td>Fall/ A</td>
<td>4</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Biostatistics (analytical training) OR PREV 621</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PREV 621 Biostatistical Methods (most suitable if wet</td>
<td>Fall/A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>lab training) OR PREV 619/PREV 621</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPLS 716 Genomics and Bioinformatics</td>
<td>Spring/ A</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>OR PREV 619/PREV 621</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPLS 601 Mechanisms in Biomedical Sciences</td>
<td>Fall/ A</td>
<td>8</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>CIPP 907 or 909 Research Ethics/ Responsible Conduct of</td>
<td>Fall/ A</td>
<td>1*</td>
<td>✓</td>
<td>✓*</td>
</tr>
<tr>
<td>Research</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electives: Include at least 2 of the following:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGEN 701 Human Cytogenetics</td>
<td>Spring/ B</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGEN 711 Genetic Epidemiology</td>
<td>Spring/ B</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGEN 720 Genetics and Metabolism</td>
<td>Fall/ B</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGEN 728 Clinical Genetics I</td>
<td>Fall/ A</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGEN 731 Clinical Genetics II</td>
<td>Spring/ A</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGEN 760 Clinical Cancer Genetics</td>
<td>Spring/ A</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGEN 717 Molecular Genetics &amp; Development in Model</td>
<td>Fall/ A</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGEN 750 Topics in Molecular Medicine</td>
<td>Fall/ A</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PREV 600 Principles of Epidemiology</td>
<td>Fall/ A</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PREV 780 Molecular Epidemiology</td>
<td>Fall/ B</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ELECTIVE CREDITS</strong></td>
<td></td>
<td></td>
<td>7+</td>
<td>3+</td>
</tr>
<tr>
<td><strong>RESEARCH CREDITS</strong></td>
<td></td>
<td></td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td><strong>TOTAL CREDITS REQUIRED FOR DEGREE</strong></td>
<td></td>
<td></td>
<td>30</td>
<td>44(minimum)</td>
</tr>
</tbody>
</table>

**Key:**
- A=Annual
- B=Bi-annual
- ✓ Required course
- *Students must attend an ethics course, but are not required to register through SURFS for credit. See coordinator for details.
Outline of Study and Procession to Ph.D. Degree
It is expected that most of the coursework will be completed during the first two years of the program. In addition to coursework, students will also complete their research rotations during the first 18 months of the program.

**Typical curriculum for Ph.D. students in the Epidemiology Track, years 1 and 2***

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>PREV 600 Principles of Epidemiology (3)</td>
<td>PREV 721 Regression Analysis (2)</td>
</tr>
<tr>
<td></td>
<td>PREV 620 Principles of Biostatistics (3)</td>
<td>PREV 723 Survival Analysis (2)</td>
</tr>
<tr>
<td></td>
<td>PREV 749 Infectious Disease Epidemiology: A Global Perspective (3)</td>
<td>PREV 758 Health Survey Research Methods (3)</td>
</tr>
<tr>
<td></td>
<td>PREV 619 Introduction to SAS (1)</td>
<td></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>PREV 659 Observational Studies in Epidemiology (3)</td>
<td>PREV 801 Longitudinal Data Analysis (3) or PREV 802 Statistics for Molecular Biology (2)</td>
</tr>
<tr>
<td></td>
<td>PREV 720 Statistical Methods in Epidemiology (3)</td>
<td>PREV 803 Clinical Trials/Experimental Epidemiology (3)</td>
</tr>
<tr>
<td></td>
<td>PREV 747 Research Practicum I (3)</td>
<td></td>
</tr>
<tr>
<td><strong>Summer</strong></td>
<td>PREV 716 Chronic Disease Epidemiology (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PREV 748 Research Practicum II (2)</td>
<td></td>
</tr>
</tbody>
</table>

* Epidemiology Track PhD students must take a minimum of 7-8 elective credits and 12 dissertation research credits.

** Typical curriculum for Ph.D. students in the Molecular Epidemiology Track, years 1 and 2***

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>PREV 600 Principles of Epidemiology (3)</td>
<td>PREV 721 Regression Analysis (2)</td>
</tr>
<tr>
<td></td>
<td>PREV 620 Principles of Biostatistics (3)</td>
<td>PREV 723 Survival Analysis (2)</td>
</tr>
<tr>
<td></td>
<td>PREV 780 Molecular Epidemiology (3) or ELECTIVE</td>
<td>PREV 780 Molecular Epidemiology (3) or ELECTIVE</td>
</tr>
<tr>
<td></td>
<td>PREV 619 Introduction to SAS (1)</td>
<td></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>PREV 659 Observational Studies in Epidemiology (3)</td>
<td>PREV 711 Genetic Epidemiology (3)</td>
</tr>
<tr>
<td></td>
<td>PREV 720 Statistical Methods in Epidemiology (3)</td>
<td>PREV 802 Statistics for Molecular Biology (2)</td>
</tr>
<tr>
<td></td>
<td>PREV 747 Research Practicum I (3)</td>
<td>GPLS 716 Genomics and Bioinformatics (3)</td>
</tr>
<tr>
<td><strong>Summer</strong></td>
<td>PREV 748 Research Practicum II (2)</td>
<td></td>
</tr>
</tbody>
</table>

* Molecular Epidemiology Track PhD students must take a minimum of 11 elective and 12 dissertation research credits.

** Typical curriculum for Ph.D. students in the Human Genetics & Genomic Medicine Track, years 1 and 2***

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>GPLS 601 Mechanisms in Biomedical Sciences (8)</td>
<td>HGEN 601 Basic Human Genetics I (4)</td>
</tr>
<tr>
<td></td>
<td>GPLS 706/HGEN 608 Human Genetics seminar (1)**</td>
<td>620 Principles of Biostatistics (3) and PREV 619 Introduction to SAS (1) OR PREV 621 Biostatistical Methods (3)</td>
</tr>
<tr>
<td></td>
<td>HGEN 718 Laboratory Rotation #1 (start at end of semester)</td>
<td>GPLS 706/HGEN 608 Human Genetics seminar (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HGEN 718 Laboratory Rotation #3</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>HGEN 602 Basic Human Genetics II (4)</td>
<td>GPLS 706/HGEN 608 Human Genetics seminar (1)</td>
</tr>
<tr>
<td></td>
<td>GPLS 706/HGEN 608 Human Genetics seminar (1)</td>
<td>ELECTIVE</td>
</tr>
<tr>
<td></td>
<td>GPLPS 716 Genomics and Bioinformatics (3)</td>
<td>ELECTIVE</td>
</tr>
<tr>
<td></td>
<td>HGEN 718 Laboratory Rotation #2</td>
<td></td>
</tr>
</tbody>
</table>

* HGGM Track PhD students must take a minimum of 6-8 elective credits and 12 dissertation research credits.

** Ph.D. students sit in GPLS 706/HGEN 608 fall of year 1 and register spring of year 1 and a minimum of 3 semesters thereafter.
Summary and Timeline of Milestones to the PhD
The milestones to be completed en route to obtaining the PhD and MS are summarized in the table below and described in more detail in the text following.

Milestones for Completion of the PhD

<table>
<thead>
<tr>
<th>Step</th>
<th>PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify a mentor</td>
<td>End of Year 1 – beginning of year 2</td>
</tr>
<tr>
<td>Comprehensive exams</td>
<td>Jan of Year 2</td>
</tr>
<tr>
<td>End GRA support from GPILS and begin drawing support from mentor</td>
<td>March 1 of Year 2</td>
</tr>
<tr>
<td>Submit Abstract of proposed research, including proposed thesis committee</td>
<td>Year 2 – Year 3</td>
</tr>
<tr>
<td>Submit General Research Plan/pre-proposal</td>
<td>Year 3</td>
</tr>
<tr>
<td>Submit Dissertation proposal</td>
<td>Year 3 - 4</td>
</tr>
</tbody>
</table>

At least 3 months prior to dissertation/thesis defense

2. Complete forms and schedule thesis defense with Graduate School office
3. Provide a complete draft of your thesis to your committee at least 1 month before your defense to allow time for revisions and to give your readers adequate time to decide whether it is ready to sign off on the “Certification of Completion of the Doctoral Dissertation/Master's Thesis” form that is due 2 weeks before your defense.
4. Defense date: The program recommends that the defense be scheduled at least five days before the dissertation submission deadline to allow time for minor revisions, which there almost always are. Please note that the assumption here is that all major revisions have been worked out with the committee prior to the defense.

Thesis defense Must be enrolled in semester in which thesis is defended
Checklist for the Ph.D. Milestones

1. The student completes the equivalent of three full-time semesters of coursework and research rotations and identifies a mentor before the end of fall semester, Year 2. By March 1st of the second year, full-time PhD students on GRAs begin drawing funding support for their dissertation research from their mentor.

2. The student passes the Comprehensive Examination, in January of the second year.

3. Within 6 months of passing the Comprehensive Examination, the student, with approval from the research mentor, submits a half page description of the proposed PhD project and proposed Dissertation Committee members to the Academic Coordinator. The Graduate Program Director and Track Directors review the appropriateness of the proposed Dissertation Committee membership and the overall research area. The results of the evaluation will be provided to the student via email.

4. The student develops a pre-proposal, or General Research Plan (GRP), working with the research mentor and the proposed Dissertation Committee, including at least one committee meeting.

5. Within 12 months of passing the Comprehensive Examination, the student submits the GRP and a list of the names of the proposed Dissertation Committee members with their signatures, indicating their approval of the GRP and willingness to serve on the committee, to the Academic Coordinator. The Graduate Program Committee reviews the GRP to approve the scope and feasibility of the proposal, confirms the appropriateness of the Dissertation Committee membership, and recommends any necessary changes.

6. When the GRP is approved, the student is eligible to apply for admission to PhD candidacy. Note: Students supported by GRAs become eligible for the Level II stipend when they achieve candidacy.

7. Within 6 months of attaining candidacy status, the student completes and defends the dissertation proposal. The defense consists of a public presentation followed by a closed session in which the Dissertation Committee questions the student.

8. The student completes the proposed research and writes the dissertation. The student provides the dissertation to the Dissertation Committee Chair and readers at least one month before defense date.

9. The student is responsible for completing all forms and checking deadlines posed by the graduate school for presenting their dissertation defense. These deadlines include dates for submission of forms and materials prior to the end of the academic semester (see http://www.graduate.umaryland.edu/grad_calendar/index.html).

10. The student defends the dissertation. The defense consists of a public presentation followed by a closed session in which the Dissertation Committee questions the student.

11. The PhD degree is awarded. All degree requirements, including the dissertation defense and submission of the finalized dissertation to the Graduate School, must be completed within 4 years of admission to candidacy and no more than 9 years after admission into the Doctoral Program.

Note: Part-time Ph.D. students are not required to take the Comprehensive Exam during the second year; however, all Ph.D. students must be admitted to candidacy within five academic years of first term of enrollment in the Doctoral Program and at least two full sequential semesters or sessions (spring, summer, or fall) before graduation. All degree requirements, including the final examination of the dissertation, must be completed within four years of admission to candidacy and no more than nine years after admission into the Doctoral Program.

Identifying a Mentor

One important goal of the rotations is to help students identify a mentor who will supervise their dissertation research and provide funding once the GRA provided by GPILS expires (generally about March 1, of Year 2). Students are expected to identify their mentor by the fall of Year 2, with the mentor agreeing to pick up funding for the student in the spring of Year 2.
The Comprehensive Examination

The purpose of the Comprehensive Exam is to determine whether students are prepared to begin their independent dissertation research. On this exam, the student must demonstrate mastery of the fundamental principles and skills of their respective disciplines. In addition, they must demonstrate their ability to apply scientific reasoning to critique existing research, and to apply background knowledge to develop and implement solutions to new research problems.

Every year, an examination committee is appointed by the GPC to administer the exam. Students who have completed their third semester of full-time course work are required to take the exam when offered in January of the second year. The exam is scheduled every year prior to January 31st; a reading list is distributed via email by the academic coordinator during the fall semester preceding the exam. The GPC determines the examination’s structure.

In the Epidemiology and Molecular Epidemiology Tracks, the Comprehensive Examination will include a written component that includes data analysis. The exam may be in an open or closed book format.

In the Human Genetics and Genomic Medicine Track, the format of the Comprehensive Examination includes an in-class written exam, a take home written exam due one week after the in-class written exam, and an oral exam two weeks after the in-class written exam. Please see track leaders for a list of topic areas covered.

Students will receive one of three scores on the exam:
1. Pass
2. Not pass with option to remediate or retake the exam the following January
3. Fail with no continuation in the program

Research Abstract and Committee Selection

After passing the Comprehensive or Qualifying Exam, the student, with approval from the research mentor, must provide a brief (no more than 1 page) research abstract and propose a dissertation committee following the membership requirements of the Graduate School and the GPILS Ph.D. programs (http://www.graduate.umaryland.edu/documents/Dissertation%20Procedures.pdf). The dissertation committee must have between five and seven members, including the chair, and all members must hold a doctoral-level degree. The chair of the committee and two additional members must be regular members of the graduate faculty: http://www.graduate.umaryland.edu/graduate_people/list/grad_faculty.html. At least one committee member must be from outside the program or department. For Epidemiology and Molecular Epidemiology Track students, it is strongly recommended that one member be a biostatistician and that at least one member have expertise in epidemiologic methods. The project description and list of proposed committee members should be submitted to the academic coordinator via email. It will be reviewed by the track leaders and program director to ensure that the student is appropriately progressing toward the development of a General Research Plan. The student will be contacted via email once the proposal has been approved or if additional information or changes are required. Guidelines for the writing the Research Abstract are provided in the next section.

(single spaced with Arial 11 point or Times New Roman 12 point font)

<table>
<thead>
<tr>
<th>Component</th>
<th>Research Abstract</th>
<th>GRP (pre-proposal)*</th>
<th>Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Length</td>
<td>1.5 pages (plus references)</td>
<td>~ 10 pages (plus references)</td>
<td>~25 pages (plus references)</td>
</tr>
<tr>
<td>Abstract</td>
<td>1 page</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Aims Including Hypotheses</td>
<td>1 page</td>
<td>1 page</td>
<td></td>
</tr>
<tr>
<td>Background and Significance</td>
<td>1 page</td>
<td>5 to 7 pages</td>
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</tr>
<tr>
<td>Innovation</td>
<td></td>
<td>½ to one page</td>
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</tr>
<tr>
<td>Preliminary Data</td>
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<td>Not required, but if applicable, include in sections where relevant</td>
<td>Not required, but if applicable, include in sections where relevant</td>
</tr>
<tr>
<td>Methods Including Potential Problems and Proposed Work-arounds</td>
<td>6 pages</td>
<td>9 - 13 pages</td>
<td></td>
</tr>
<tr>
<td>Anticipated results and contribution to knowledge base</td>
<td></td>
<td>1 page</td>
<td></td>
</tr>
<tr>
<td>Feasibility/ time line</td>
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<td>1 page</td>
<td></td>
</tr>
<tr>
<td>Student’s Role</td>
<td>0.5 pages</td>
<td>0.5 pages</td>
<td>0.5 pages</td>
</tr>
<tr>
<td>Committee</td>
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<td>0.5 pages</td>
<td>0.5 pages</td>
</tr>
<tr>
<td>References</td>
<td>No limit</td>
<td>No limit</td>
<td>No limit</td>
</tr>
<tr>
<td>Procedure for Evaluation/ Approval</td>
<td>Approval of written document by track leader group</td>
<td>Approval of written document by GPC</td>
<td>Distributed to dissertation committee and PEHG faculty and defended orally to faculty</td>
</tr>
</tbody>
</table>

* specific guidelines for write-up of the GRP provided in table below. See also NIH guidelines for an R series grant.
General Research Plan (Pre-proposal)

Within 12 months of passing the Comprehensive Examination, the student should submit a General Research Plan (GRP). General formatting requirements for the GRP are provided in the preceding table. A more detailed descriptive of the required elements is provided in the table below. Students should work with the proposed dissertation committee members to develop the GRP, and should have at least one committee meeting during this time to discuss the proposed project. The purpose of the GRP is to assure that the proposed project appears to be feasible and at an acceptable standard in the initial stages of the project, so that large amounts of time and effort are not invested in a potentially unproductive direction. The Graduate Program Committee (GPC) will review the GRP to determine whether the student should pursue development of the proposed research or should re-evaluate the area of interest.

The GRP must be submitted to the academic coordinator at least two weeks prior to the GPC meeting during which it will be reviewed. It must be no longer than 10 pages (12 pages for HGEN students), and it must be accompanied by a dissertation committee member proposal form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx) that contains the names and signatures of proposed dissertation committee members, indicating their approval of the GRP and willingness to serve on the committee. (Electronic signatures are sufficient as long as an email is sent to the academic coordinator from each proposed committee member.) GPC meetings are held on a monthly basis. Please contact academic coordinator for specific dates. The chair of the student’s proposed dissertation committee should attend the GPC meeting when the GRP is discussed, or they may delegate this to another member of the dissertation committee. The GRP will be evaluated and a decision for or against approval of the GRP and committee membership will be reached. The results of the evaluation and decision will be provided to the student via email.

**GRP Evaluation Criteria**

The Graduate Program Committee will evaluate the General Research Plan according to the following criteria:

- **Significance:** Does the proposed study address an important health problem?
- **Originality:** Is the proposed study original? Does it fill a gap in knowledge?
- **Methods:** Are the proposed methods fundamentally valid? Are they feasible?
- **Scope:** Is the amount and complexity of the proposed work appropriate for doctoral level scholarship?
- **Student’s role:** Will the student play a primary role in the conception and execution of the study?
- **Feasibility:** Is the proposed work feasible within a reasonable time frame?
- **Committee:** Is the composition of the student’s committee appropriate?

**Admission to Candidacy**

Once the GRP has been approved, the student is eligible to apply for candidacy. The application can be found on the Graduate School website (http://www.graduate.umaryland.edu/graduate_people/degree_cert.html). The student is responsible for making sure that the academic coordinator receives a copy of the application for candidacy to keep on file. Students supported by Graduate Research Assistantships (GRAs) become eligible for the Level II stipend when they achieve candidacy.
### Specific Aims
- Present the study aims and hypotheses.

### Background and Significance
- Give a brief summary of the existing literature on the study topic. The text should not include a detailed literature review describing all relevant studies and their findings. Rather, summarize what is known and what is not known about the topic. Indicate how the proposed study will fill a gap in existing knowledge. Make sure you highlight the significance and originality of the proposed project.
- Students are not required to have done preliminary studies or to have collected pilot data for their dissertation project. If you have done preliminary studies on your topic, you can include those in the summary of background literature but do not include a detailed description of methods and results of the preliminary studies.
- If your preliminary studies shed light on the feasibility, methods, or sample size of the proposed project, you do not need to describe those results in the Background and Significance section. Those preliminary results should be referred to in the sections where they are relevant (e.g., feasibility, methods, and/or sample size).

### Methods
- Study design: State which epidemiologic study design is being proposed, if applicable.
- Participants/materials: Present eligibility criteria if applicable and describe how study participants or materials (e.g. animal models, cell lines, assays, reagents) will be (or were) selected.
- Measures: Define the assays, experiments, outcome variable(s), predictor variable(s), confounders, and/or effect modifiers, as appropriate. Briefly describe study measures conceptually. Do not give lengthy descriptions of laboratory methods or questionnaires.
- Sample size and power: Provide calculations to justify the proposed sample size as appropriate. Be sure to discuss the magnitude of the effect that can be detected and the clinical or biologic significance of that effect.
- Analysis: Briefly describe analytic methods. Give enough information to demonstrate that you understand how to use the proposed statistical methods to address the study hypotheses.
- Strengths: Briefly describe the study’s strengths.
- Limitations: Briefly describe the study’s limitations. Be sure to discuss the major sources of information bias, selection bias and other potential sources of error as appropriate and how they will be handled. Also be sure to discuss the role of confounding in evaluating your study hypotheses and how confounding will be handled.
- Note: Students who are using existing data still need to thoroughly discuss all the points listed above.

### Student’s Role
- Describe your role in the development of the research questions and hypotheses, collection and/or analysis of the data, performance of any experiments or assays, and dissemination of results.

### Feasibility
- Timeline: Provide a detailed timeline.
- Sample recruitment: Show clearly that it is feasible to accrue the required number of participants or perform the required experiments or assays within the proposed time period.
- External factors: Outline factors over which you have little or no control (e.g., parent study recruitment rates, obtaining required approvals) that could impact your ability to complete the project as planned.

### Committee
- Discuss the unique expertise of each member and how each will contribute to the work.

### References
- List references referred to in the General Research Plan
Dissertation Proposal
The student writes the Dissertation Proposal under the direction of his or her dissertation committee. The full Dissertation Proposal is intended to convey essential information about the student's doctoral dissertation research. It should succinctly identify the problem to be addressed, review relevant background, state the significance of the problem, and describe the methods to be used in carrying out the project. The dissertation proposal should be at least 25 (single spaced) pages and should cover the areas indicated in the table on page 20. The first two chapters (background and methods) will form the basis for the dissertation itself. The proposal is an important document outlining the student's dissertation research, and its acceptance implies that the dissertation committee and student agree on the plan of study. The proposal should be viewed as a preliminary document detailing a research plan. The final documentation of the importance of the project, its methodology, and the results and implications is to be reserved for the doctoral dissertation.

Dissertation Proposal and Dissertation Proposal Defense
When the Dissertation Committee agrees that the full proposal is complete, the student will arrange to conduct a defense of the proposal. The defense is open to all departmental faculty and graduate students; however, the members of the student's dissertation committee, the GPC chair and at least one other member of the GPC must be present at the Proposal Defense. This GPC member is in addition to any GPC members who may be on the student’s Dissertation Committee. All committee members must sign the Dissertation Proposal Form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx) to indicate that they have read and that they approve of the full proposal. (Electronic signatures are sufficient as long as an email is sent to the academic coordinator.) With this approval, the Dissertation Committee is also signifying agreement that the proposal is of sufficient scope and that the student may proceed to the Proposal Defense.

At least two weeks prior to the Proposal Defense, the student will provide copies of the proposal to all members of the Dissertation Committee. The student will provide the academic coordinator with a signed copy of the Dissertation Proposal form. The academic coordinator will schedule a room and distribute announcements to faculty and students. The Dissertation Proposal Defense is conducted as an oral defense and is administered and graded by the student’s Dissertation Committee. The defense is conducted to provide constructive criticism for the proposed dissertation work. The defense is scored on a pass/fail basis, and the student is responsible for providing the committee with a copy of the Dissertation Proposal Defense Form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx) on which to indicate the score. The Dissertation Committee will advise the student of any changes that must be made before the student can proceed to work on the final Doctoral Dissertation. This form should be returned to the academic coordinator within two days of the defense.

The student will work with the dissertation committee and other experts, as needed, to assure the completion of the dissertation. It is the responsibility of the student to contact the dissertation committee regularly to discuss progress and plans related to the dissertation, to keep them informed and seek their input.

Doctoral Dissertation
The Doctoral Dissertation is an original, scholarly research project that demonstrates the student’s unconditional ability to conduct independent research. The student may collect most or all of the study data or may use previously collected data. A student who chooses to use existing data is responsible for gaining access to the data, for ensuring that the data set is adequate to answer the research question, and for establishing that the data are of acceptable quality.

Publication of manuscripts resulting from the dissertation is a critical accomplishment for research scholars. It is also an essential contribution to the ongoing work of the research group that supports the student throughout the completion of his or her dissertation. Prior to submission for publication, manuscripts must be reviewed and approved by all co-authors. Students are expected to publish manuscripts based on their dissertations and are encouraged to submit manuscripts to journals for peer review as they are completed prior to the dissertation defense. Although submission of the manuscripts is not required prior to graduation, students are expected to publish in a timely fashion.
Guidelines for the Dissertation

Students may choose a conventional or a manuscript-based dissertation format. The format should be agreed upon by the student, mentor and dissertation committee by the time of the defense of the dissertation proposal. A single abstract summarizing the dissertation is required for either format. The dissertation must meet all criteria (except those related to presentation format) specified elsewhere in the Student Handbook. The style of the dissertation should follow the Graduate School’s dissertation style guide

The conventional dissertation must be written by the student and may not include, as results, work that was conducted by others or work published prior to the General Research Plan being submitted to the Graduate Program Committee. It must address a consistent, hypothesis-based theme and should be organized as follows:
1. The first chapter should be a short introduction.
2. The second chapter should be a comprehensive critical literature review which leads to and supports the dissertation aims and hypotheses.
3. The third chapter should be a complete and detailed description of the study methods.
4. The fourth chapter should present the results of the student’s original research, in sufficient detail for the committee to assess the student’s accomplishments.
5. The fifth chapter should summarize and discuss the significance of the findings, especially in the context of other published literature. It should include a discussion of the conclusions drawn from the research, and should make recommendations for further studies while clearly explaining the implications of the student’s work.
6. The dissertation should include an appendix that includes additional tables and results deemed necessary to fully understand the data.

The manuscript-based dissertation must meet the following criteria: (1) It must include a minimum of two original, research manuscripts, linked to a common theme; (2) The student must be first author and have written both manuscripts; (3) The dissertation may not include, as results, work that was conducted by others or work published prior to the General Research Plan being submitted to the Graduate Program Committee; and (4) The manuscripts must be reviewed and determined suitable for publication in a peer-reviewed scientific journal by the readers and chair of the dissertation committee. The manuscript-based dissertation should be organized as follows:
1. The first chapter should be a comprehensive critical literature review which leads to and supports the aims and hypotheses of the manuscripts.
2. The second chapter should be a complete and detailed description of the study methods.
3. The third, fourth, and possibly later chapters should be manuscripts that communicate the student’s original research. Each chapter should be written as a complete document suitable for publication, although additional detail may be included to more fully demonstrate the student’s accomplishments to the dissertation committee.
4. The final chapter should integrate and discuss the significance of the findings reported in the manuscripts. It should include a discussion of the overall conclusions drawn from the research, and should make recommendations for further studies while clearly explaining the implications of the student’s work.
5. The dissertation should include an appendix that includes additional tables and results deemed necessary to fully understand the data.

Students may choose from a traditional or a manuscript-based dissertation format and are expected to follow the Graduate School’s dissertation style guide
Final Dissertation Defense

Students are advised to consult the Graduate School calendar frequently during preparation for the Final Dissertation Defense. Important deadlines can be found at http://www.graduate.umaryland.edu/graduate_people/index.html. After the dissertation receives approval by the committee, the student will defend the dissertation in an oral presentation of the work to faculty and students.

Students are responsible for submitting all necessary forms in order to graduate, and for providing the academic coordinator with copies of all forms submitted to the Graduate School. These forms include:

Nomination of Members of Final Doctoral Examination Committee (due six months before defense)
http://www.graduate.umaryland.edu/documents/doctrinal_committee%20update%202012.pdf
Application for Diploma (due date changes each semester-check Graduate School calendar)
http://www.simsweb.umaryland.edu/
Certification of Completion of the Doctoral Dissertation (due two weeks before defense)
Announcement of Doctoral Dissertation Defense (due two weeks before defense)
http://www.graduate.umaryland.edu/documents/announcement.pdf
The Procedures for Examination of the Doctoral Dissertation should also be carefully reviewed at

A Report of Examining Committee form will be sent to the Graduate School appointed Dean’s Representative on the student’s committee before the defense. The completed form must be returned to the Graduate School within two working days of the oral defense, and the academic coordinator must receive a copy.

Please note that students must be registered for at least one credit during the semester in which they plan to graduate, including summer and winter sessions. All students applying for graduation must have registered for an overall total of at least 12 doctoral dissertation research credits (PREV 899) and must have completed a successful Dissertation Defense.
Outline of Study and Process to M.S. Degree

The Program in Epidemiology and Human Genetics offers three tracks in the M.S. degree program: Epidemiology and Preventive Medicine; Clinical Research; and Human Genetics and Genomic Medicine.

Typical curriculum for M.S. students in the Epidemiology and Preventive Medicine Track, years 1 and 2*

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td><strong>Fall</strong></td>
</tr>
<tr>
<td>PREV 600 Principles of Epidemiology (3)</td>
<td>PREV 668 Environmental and Occupational Health (3)</td>
</tr>
<tr>
<td>PREV 620 Principles of Biostatistics (3)</td>
<td>ELECTIVE (3-6) / PREV 799 Master’s Research (3)</td>
</tr>
<tr>
<td>PREV 648 Health Services Policy, Management and Finance (3)</td>
<td></td>
</tr>
<tr>
<td>PREV 619 Introduction to SAS (1)</td>
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<tr>
<td><strong>Spring</strong></td>
<td><strong>Spring</strong></td>
</tr>
<tr>
<td>PREV 659 Observational Studies in Epidemiology (3)</td>
<td>ELECTIVE (3-6) / PREV 799 Master’s Research (3)</td>
</tr>
<tr>
<td>PREV 720 Statistical Methods in Epidemiology (3)</td>
<td></td>
</tr>
<tr>
<td>PREV 747 Research Practicum I (3)</td>
<td></td>
</tr>
<tr>
<td><strong>Summer</strong></td>
<td><strong>Summer</strong></td>
</tr>
<tr>
<td>ELECTIVE (3)</td>
<td>ELECTIVE (3)</td>
</tr>
<tr>
<td>PREV 748 Research Practicum II (2)</td>
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</tr>
</tbody>
</table>

* EPM M.S. students, who are not writing a Master’s thesis, must take at least 12 elective credits; M.S. students who are writing a thesis must take at least 6 elective credits and 6 thesis research credits. Degree requirements chart can be accessed at the following site: [http://lifesciences.umaryland.edu/epidemiology/epi_req.aspx](http://lifesciences.umaryland.edu/epidemiology/epi_req.aspx).

Typical curriculum for M.S. students in the Human Genetics & Genomic Medicine Track, years 1 and 2*

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td><strong>Fall</strong></td>
</tr>
<tr>
<td>HGEN 601 Basic Human Genetics I (4)</td>
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<tr>
<td>620 Principles of Biostatistics (3) and PREV 619 Introduction to SAS (1) OR PREV 621 Biostatistical Methods (3)</td>
<td>GPLS 706/HGEN 608 Human Genetics seminar (1)</td>
</tr>
<tr>
<td>GPLS 706/HGEN 608 Human Genetics seminar (1)**</td>
<td>PREV 799 Master’s Research (3)</td>
</tr>
<tr>
<td>HGEN 718 Laboratory Rotation #1 (start at end of semester)</td>
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<tr>
<td><strong>Spring</strong></td>
<td><strong>Spring</strong></td>
</tr>
<tr>
<td>HGEN 602 Basic Human Genetics II (4)</td>
<td>GPLS 706/HGEN 608 Human Genetics seminar (1)**</td>
</tr>
<tr>
<td>GPLS 716 Genomics and Bioinformatics (3)</td>
<td>PREV 799 Master’s Research (3)</td>
</tr>
<tr>
<td>GPLS 706/HGEN 608 Human Genetics seminar (1)</td>
<td>ELECTIVE</td>
</tr>
<tr>
<td>HGEN 718 Laboratory Rotation #2</td>
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</table>

* HGGM Track MS students required to take a minimum of 7 elective credits and 6 research credits.

** M.S. students sit in GPLS 706/HGEN 608 fall of year 1 and spring of year 2 and register spring of year 1 and fall of year 2.
### Typical curriculum for M.S. students in the Clinical Research Track, years 1 and 2*

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td><strong>Year 2</strong></td>
</tr>
<tr>
<td>PREV 600 Principles of Epidemiology (3)</td>
<td>ELECTIVE/CONCENTRATION (3-6)</td>
</tr>
<tr>
<td>PREV 620 Principles of Biostatistics (3)</td>
<td>PREV 799 Mater’s Research (3)</td>
</tr>
<tr>
<td>PREV 780 Molecular Epidemiology (3) or ELECTIVE</td>
<td></td>
</tr>
<tr>
<td>PREV 619 Introduction to SAS (1)</td>
<td></td>
</tr>
<tr>
<td>PREV 616 Introduction to Clinical Investigation at UMB (2) (usually offered first full week in August)</td>
<td></td>
</tr>
<tr>
<td>PREV 633 Application of Legal and Regulatory Issues in Clinical Research (1)</td>
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<tr>
<td>Winter</td>
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<tr>
<td>PREV 706 Research Informatics: Data Management in Clinical Research (2)</td>
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<tr>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>PREV 720 Statistical Methods in Epidemiology (3)</td>
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</tr>
<tr>
<td>PREV 747 Research Practicum I (3) (non thesis)</td>
<td></td>
</tr>
<tr>
<td>ELECTIVE/CONCENTRATION (3-6)</td>
<td></td>
</tr>
<tr>
<td>Summer**</td>
<td></td>
</tr>
<tr>
<td>PREV 748 Research Practicum II (2) (non-thesis)</td>
<td></td>
</tr>
<tr>
<td>ELECTIVE/CONCENTRATION (3-6)</td>
<td></td>
</tr>
<tr>
<td>PREV 799 Mater’s Research (3)</td>
<td></td>
</tr>
</tbody>
</table>

* CR M.S. students who are not writing a Master’s thesis, must take at least 15 elective or concentration credits; M.S. students who are writing a thesis must take at least 14 elective or concentration credits and 6 thesis research credits. Degree requirements chart can be accessed at the following site: [http://lifesciences.umaryland.edu/epidemiology/epi_req.aspx](http://lifesciences.umaryland.edu/epidemiology/epi_req.aspx).

### Concentration Course Options for Clinical Research Track

**Epidemiologic Research Concentration (6 credits)**
PREV 659 Observational Studies in Epidemiology (3 credits)
PREV 803 Clinical Trials and experimental Epidemiology (3 credits)

**Patient Oriented Research Concentration (6 credits)**
PHAR 600 Principles of Drug Discovery (3 credits)
PREV 803 Clinical Trials and Experimental Epidemiology (3 credits)

**Human Genetics Concentration (7 credits)**
HGEN 601 Human Genetics I (4 credits)
PREV 711 Genetic Epidemiology (3 credits)

**Outcomes/Health Services Research Concentration (6 credits)**
PREV 648 Introduction to the Health System and Health Policy Management (3 credits)
PREV 758 Health Survey Research Methods (3 credits)

**Research Ethics Concentration (5 credits)**
PREV 637 Ethical Issues in Clinical Research (2 credits)
PREV 638 Ethical Issues in International Health (3 credits)

**Remaining Coursework**
Practicum/Electives (9-11 credits)
PREV 747 and PREV 748 Research Practicum I and II or Master’s Thesis (5-6 credits, remainder electives to total 36 credits)
Summary and Timeline of Milestones to the MS

The milestones to be completed en route to obtaining the MS are summarized in the table below and described in more detail in the text following.

### Milestones for Completion of the MS

<table>
<thead>
<tr>
<th>Step</th>
<th>MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify a mentor</td>
<td>End of year 1</td>
</tr>
<tr>
<td>Submit Abstract of proposed research, including proposed</td>
<td>Beginning of summer (if graduating early, at least 1 semester before</td>
</tr>
<tr>
<td>thesis committee</td>
<td>graduation)</td>
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<tr>
<td>Submit General Research Plan/pre-proposal</td>
<td>Beginning of year 2 (if graduating early, at least 1 semester before</td>
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<tr>
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<td>graduation)</td>
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<tr>
<td>At least 3 months prior to dissertation/thesis defense</td>
<td>1. Check deadlines at <a href="http://www.graduate.umd.edu/grad_calendar/index.html">http://www.graduate.umd.edu/grad_calendar/index.html</a>.</td>
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<td>2. Provide a complete draft of your thesis to your committee at least</td>
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<td>1 month before your defense to allow time for revisions and to give</td>
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<td>your readers adequate time to decide whether it is ready to sign off</td>
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<td></td>
<td>on the “Certification of Completion of the Doctoral Dissertation/Master's Thesis” form that is due 2 weeks before your defense.</td>
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<td>3. Defense date: The program recommends that the defense be scheduled</td>
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<td>at least five days before the dissertation submission deadline to</td>
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<td>allow time for minor revisions, which there almost always are. Please</td>
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<td>note that the assumption here is that all major revisions have been</td>
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<td>worked out with the committee prior to the defense.</td>
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<tr>
<td>Thesis defense</td>
<td>Must be enrolled in semester in which thesis is defended</td>
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</table>

Guidelines for Master’s Thesis (Required for Human Genetics and Genomic Medicine Track, optional for Epidemiology and Clinical Research Tracks)

**Purpose**

The purpose of the Master's Thesis is to provide students with the opportunity to develop an advanced understanding of and skills in epidemiologic research by progressing through each of the following steps:

1. formulation of a research question based on review of the literature and information from experts in the field of interest
2. identification of epidemiologic methods and measurements that will accurately address the research question
3. assembly of adequate data
4. analysis and interpretation of results
5. written and oral presentations of results

A Master's thesis should address an unanswered research question. The scope of the research must be such that it can be both of high quality and completed within the allocated time. There may be acceptable Master's research projects that do not entail collecting primary data. However, a student who chooses to use existing data is responsible for gaining access to the data, for ensuring that the data set is adequate to answer the research question, and for establishing that the data are of acceptable quality.

**Procedures**

Any student interested in proposing Master's Thesis research should select an area of research for the Master's Thesis through discussions with his or her academic advisor and other faculty members. Students in the Clinical Research Track will also consult their clinical advisor. Please also refer to pages 23-24 for important steps and deadlines to follow while preparing to defend a thesis.
General Research Plan
The purpose of the General Research Plan (GRP) is to assure that the proposed project appears to be feasible and at an acceptable standard in the initial stages of the project so that large amounts of time and effort are not invested in a potentially unproductive direction. Therefore, the drafting of a General Research Plan is intended to require the minimum time necessary to delineate the basic substance and form of the proposed research. The faculty review of the General Research Plan through the GPC will judge whether the student should pursue development of the proposed research or should re-evaluate the area of interest. Membership of the student’s proposed research committee is also subject to the approval of the GPC. The General Research Plan should be formatted using the template available on the GPILS website: http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx.

The GRP must be submitted to the academic coordinator two weeks prior to the GPC meeting in which it will be up for review. It must be no longer than 10 pages, and it must be accompanied by a completed committee member proposal form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx). GPC meetings are held on a monthly basis. Please contact academic coordinator for exact dates. The student’s research mentor will be invited to attend the meeting to field any questions that the committee may have.

Committee Selection
The committee must have between three and five members. At least three of the committee members must be members of the graduate faculty. Students in the Epidemiology Track will identify and obtain approval of an EPH faculty member as Thesis Committee chair. Students in the Clinical Track will identify co-chairs, a faculty member in EPH and a UM faculty member in a clinical department. Potential committee members are proposed as part of the submission of the General Research Plan.

For students in the Epidemiology Track, the Thesis Committee chair must be a full-time, on-site member of the UM faculty with an academic appointment in the Department of Epidemiology and Public Health at the rank of assistant professor or above and must be a Graduate Faculty Member. An exception may be made for a faculty member who is unusually well qualified to chair the committee, but whose primary appointment is in another department.

For students in the Clinical Track, the clinical co-chair must be a member of the UMB clinical faculty at the rank of Assistant Professor or above with expertise in the biomedical field of the proposed research. At least one member of the committee, usually the chair, should have experience as a principal investigator of a funded, peer-reviewed research project.

The Thesis Committee chair should attend the GPC meeting when his or her advisee’s GRP is discussed or they may delegate this to a member of the thesis committee. The GRP will be evaluated and a decision for or against approval of the thesis and committee membership will be reached. The results of the evaluation and decision will be provided to the student and research committee members.

Committee Selection (Human Genetics and Genomic Medicine Track)
For students in the Human Genetics Track, the Thesis Committee Chair must be a full-time, on-site member of the UMB faculty who is affiliated with the Human Genetics and Genomic Medicine Program at the rank of Assistant Professor or above and must be a Graduate Faculty Member. At least one member of the Committee, usually the chair, should have experience as a principal investigator of a funded, peer-reviewed research project. At least one member of the committee should be knowledgeable in the biomedical field of the proposed research. The student, in consultation with the committee chair will identify potential committee members.
Final Master’s Thesis
Students are advised to consult the Graduate School calendar frequently during preparation for the Master’s Thesis Defense. Important deadlines can be found at http://www.graduate.umaryland.edu/graduate_people/index.html. Students should be sure to consult the Graduate School website for the thesis style guide as well: (http://www.graduate.umaryland.edu/documents/Electronic%20Thesis%20and%20Dissertation%20Style%20Guide%202013.pdf.) After the thesis receives final approval by the committee, the student will make an oral presentation of the work to faculty and students.

Students are responsible for submitting all necessary forms in order to graduate, and for providing the academic coordinator with copies of all forms submitted to the Graduate School. These forms include:

Nomination of Members of Final Thesis Defense Committee (due two months before defense)
http://www.graduate.umaryland.edu/documents/masters_committee20update202012.pdf
Application for Diploma (due date changes each semester-check Graduate School calendar)
http://www.simsweb.umaryland.edu/
Fulfillment of Course Requirements for Master’s Degree (due date changes each semester-check Graduate School calendar) http://www.graduate.umaryland.edu/documents/masters_courses.pdf
Certification of Completion of the Master’s Thesis (due two weeks before defense)

Microsoft Word versions of forms can be found here:
http://www.graduate.umaryland.edu/current_students/degree_cert.html

http://www.graduate.umaryland.edu/graduate_people/index.html
Dual Degree Programs
For dual degree students in the PHSR and Gerontology Programs, the Ph.D. dissertation serves as the M.S. thesis. Both graduate programs involved in the dual degree must approve the composition of the student’s dissertation committee. At least one dissertation committee member must be an epidemiologist and graduate faculty member with a primary appointment in EPH; at least one member must be a biostatistician from EPH and a member of the graduate faculty.

M.S. Epidemiology / Ph.D. Gerontology
This dual degree program is available to students who are accepted into the Gerontology doctoral program and remain in good standing according to the requirements found on Graduate School website:
http://www.graduate.umaryland.edu/catalog/academic_performance_phd.html
http://www.graduate.umaryland.edu/catalog/academic_performance_master.html
While primarily intended for students in the epidemiology track, all gerontology doctoral students are eligible to apply for admission to this program. Those wishing to apply to the dual degree program upon admission should indicate so in their application letter.

The Graduation Program Committee approves the membership of the dissertation committee, but leaves the details of the dissertation to that committee’s oversight. A GRP does not have to be submitted to the GPC for approval; however, the student should submit a committee member proposal form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx

Course Requirements for the Epidemiology/Gerontology Dual Degree
Methods (15 credits)
GERO 750 Theory/Methods I (3 credits)
GERO 751 Theory/Methods II (3 credits)
PREV 600 Principles of Epidemiology (3 credits)
PREV 659 Observational Studies in Epidemiology (3 credits)
PREV 758 Health Survey Research Methods (3 credits)

Gerontology Core (15 credits)
GERO 711 Biology of Aging (3 credits)
GERO 672 Issues in Aging Policy (3 credits)
GERO 681 Epidemiology of Aging (3 credits)
GERO 700 Sociocultural Gerontology (3 credits)
GERO 786 Psychological Aspects of Aging (3 credits)

Biostatistics (11-12 credits)
PREV 620 Principles of Biostatistics (3 credits)
PREV 619 Introduction to SAS (1 credit)
PREV 720 Statistical Methods in Epidemiology (3 credits)
PREV 721 Regression Analysis (2 credits)
PREV 723 Survival Analysis (2 credits) or PREV 801 Longitudinal Data Analysis (3 credits)

Other requirements
PREV 803 Clinical Trials and Experimental Epidemiology (3 credits)
Advanced Epidemiology Elective (3 credits)
Dissertation Research (12 credits)
CIPP 909 Responsible Conduct of Research (1 credit)
M.S. Epidemiology / Ph.D. Pharmaceutical Health Services Research

This program is available to students who are accepted into the PHSR doctoral program and remain in good standing according to the requirements found on Graduate School website:
http://www.graduate.umaryland.edu/catalog/academic_performance_phd.html
http://www.graduate.umaryland.edu/catalog/academic_performance_master.html

While primarily intended for students in the pharmacoepidemiology track, all PHSR doctoral students are eligible to apply for admission to this program. Those wishing to apply to the dual degree program upon admission should indicate so in their application letter.

To ensure that the dissertation has significant epidemiological content and/or methods, the Graduate Program Committee will approve the student’s General Research Plan. The GRP must be submitted to the academic coordinator two weeks prior to the GPC meeting during which it will be up for review. It must follow the GRP template (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx), and it must be accompanied by the committee member proposal form (http://lifesciences.umaryland.edu/epidemiology/resources_students.aspx The completed form must contain the names of proposed committee members. (Emails to the academic coordinator indicating approval of the GRP and willingness to serve on the committee may be sent in place of an actual signature.)

GPC meetings are held on a monthly basis. Please contact academic coordinator for exact meeting dates. The student’s research mentor will be invited to attend the meeting to provide a brief summary and field any questions that the committee may have. The GPC will notify the student of its approval or disapproval of the GRP and of any change in dissertation committee membership from that proposed by the student.

Course Requirements for the Epidemiology/Pharmaceutical Health Services Research Dual Degree

Methods (6 credits)
PHSR 701 Research Methods I (3 credits)
PHSR 702 Research Methods II (2/3 credits)

Statistics (11 credits)
PREV 619 Introduction to SAS (1 credit)
PREV 620 Principles of Biostatistics (3 credits)
PREV 720 Statistical Methods in Epidemiology (3 credits)
PREV 721 Regression Analysis (2 credits)
PREV 723 Survival Analysis (2 credits)

PHSR Core (12 credits)
PHSR 610 Pharmacy, Drugs and the Health Care System (3 credits)
PHSR 620 Introduction to Health Behavioral Theory (3 credits)
PHSR 650 Pharmaceutical Economics (3 credits)
PHSR 704 Pharmacoepidemiology (3 credits)

Epidemiology Core (15 credits)
PREV 600 Principles of Epidemiology (3 credits)
PREV 659 Observational Studies in Epidemiology (3 credits)
PREV 803 Clinical Trials and Experimental Epidemiology (3 credits)
PREV Electives (6 credits) *

*For a list of possible electives please visit: http://lifesciences.umaryland.edu/epidemiology/epi_electives.aspx.