



STUDENT HANDBOOK

Graduate Programs In Epidemiology and Preventive Medicine

2006-2007

**University of Maryland Baltimore
School of Medicine
Department of Epidemiology and Preventive Medicine**

Revised 12/15/06

POLICY STATEMENT

Contents of the Graduate Student Handbook state the policies and procedures of the Department of Epidemiology and Preventive Medicine (*DEPM*) graduate programs.

Curriculum requirements as stated in this Handbook are to be followed by graduate students. Students are responsible for ensuring that they meet all department and graduate school requirements. Important Graduate School information, including dates and deadlines, are listed on the Graduate School's website, www.graduate.umaryland.edu

GENERAL PROGRAM INFORMATION

All graduate students must fulfill graduate school requirements as outlined in The Graduate School Catalog in addition to the departmental requirements for their degree. Students are responsible for compliance with the rules and procedures of the graduate school.

Students entering the Department of Epidemiology and Preventive Medicine graduate degree programs should refer to the requirements outlined in this handbook for the Master of Science degrees in Epidemiology and Preventive Medicine and in Clinical Research, and the PhD degree in Epidemiology. In addition, the Graduate School's publication, Graduate Assistant Policies and Guidelines, provides useful information to PhD student supported as Graduate Research Assistants (GRA).

Ethics Course: All graduate students are required to participate in at least one ethics course before graduation. The Graduate School offers several of these (non-credit) courses throughout the year.

Grades: In order to enroll in any course for which one or more required courses are prerequisites, the student must have attained a grade of B or higher in all of those required courses.

Students must achieve an **A or a B in all required courses** in order to receive the Master of Science or PhD degree. A course in which a grade of less than B is received may be repeated. The grade from the repeated course replaces the original course grade. (A grade of B minus is not acceptable for required courses in which students are expected to earn an A or B.)

Students must be in "good standing" to be eligible for an **Incomplete** grade, i.e., have a passing grade in the course before the time when assignments are missing. Students must complete course work to replace a grade of Incomplete with a course grade within one year. The course master may shorten that time frame.

Late Submissions of Course Assignments: Time limits will vary by course and be determined by the course master.

Transferred Credit: No more than six credits can be transferred from non-degree status, or from another institution or another UMB graduate program into the MS degree program (credits may not be transferred into the PhD degree program). Permission to

transfer in credit will be made in consultation with the student's academic advisor and with the approval of the course master.

External Courses Any course outside the department or University of Maryland Baltimore (UMB) which a student, in consultation with his/her academic advisor, would like to take to fulfill elective credits for their degree requires approval from the graduate program director.

Independent Study Students may develop independent study courses (for a maximum of 6 credits) with members of the graduate faculty. Independent Study Records are available in the academic office and a full description of the course must be filed with the academic office prior to the semester's start. Independent study courses require the approval of the graduate program director.

Course Waivers:

Required Courses

A maximum of 8 credit hours can be waived. The following courses cannot be waived:

PREV 600 Principles of Epidemiology
PREV 659 Observational Studies in Epidemiology
PREV 747 and 748 Research Practicum I & II
Any 800 Level Courses

Responsibility for Approval of a Waiver

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.

Exceptions to this policy may be granted only with the approval of the Graduate Program Committee (GPC) and are made on a case-by-case basis.

Elective Courses At least 7 credit hours must be taken in the UMB Epidemiology and Preventive Medicine graduate program. All courses taken in other departments of UMB, at other USM institutions or any other universities, must be approved by the graduate program director.

Time Limits: There is a time limit of five years for completion of the Master of Science degree and nine years for the PhD degree, whether in the program as a full-time or part-time student. This time limit includes any leave of absence granted from the program for a semester or longer.

Withdrawal from classes: It is possible to withdraw from any class through the first three weeks of the semester without regard to academic performance. Anyone wishing to withdraw from any class beyond the three-week deadline must receive written permission from the director of the graduate program before submitting a drop request or withdrawal form to the Office of Records and Registration. Unless there are extenuating circumstances, students in academic difficulty will not be allowed to withdraw beyond the three-week deadline. (Please note: UMB refund policies are provided with registration information.)

Leave of Absence: Students who wish to continue in a degree program, but choose not to register in a particular semester, are required to take an approved leave of absence. The student must request approval from both the student's advisor and the graduate program director. Requests for leaves of absence must be in writing and will be considered on a case-by-case basis. A leave of absence does not extend the time in which the degree must be completed.

Course Grade Appeal Procedures: The Graduate School at the University of Maryland Baltimore provides students with a mechanism for reviewing course grades alleged to be "arbitrary or capricious." Information is included on the Graduate School Website. Mediation services are available when disagreements and differences of opinion arise between graduate students and their advisors and/or the graduate program.

Graduate Research Assistant (GRA) The general guidelines governing assistantships are outlined in Graduate Assistant Policies and Guidelines published by the UMB Graduate School and given to all graduate students who have signed a GRA contract. Students receiving a full graduate assistantship may not be employed by the University of Maryland for more than the 20 hours per week committed to their assistantship. A half-time assistant cannot be employed more than 10 hours a week.

Twenty hours per week is considered the maximum time a full-time student can expect to work and successfully complete the degree program. Therefore, any graduate assistant seeking employment outside the University of Maryland, must have approval from the graduate program director. A brief description and reason for outside employment should be submitted in writing prior to making a commitment to outside employment. This approval process will function to improve communication and cooperation between the department and the student while the student is under contract as a full-time student and employee.

FACULTY ADVISORS

Each graduate student will be assigned an academic advisor to help him/her plan their graduate program. The student is responsible for scheduling regular meetings with his/her advisor to assess progress and address any questions or concerns. Registration for courses must be approved in writing by the academic advisor.

During their graduate training, students may wish to change academic advisors for any number of reasons. Students desiring to change advisors should talk to the academic program coordinator prior to initiating any formal request.

DEPARTMENT EDUCATIONAL OPPORTUNITIES

Department Seminar Series

This series is planned by a faculty committee. Announcements are distributed in advance for the Seminars which are scheduled on the second and fourth Thursdays of the month at noon. All full-time graduate students are expected to attend.

Research Workshops

Research workshops will be planned on an "as needed basis". Research workshops provide a forum for discussion of individual or group research projects at various stages of completion. Faculty members will attend and may also be invited to discuss their own work at these workshops. (Note: It is permissible to bring your lunch to these seminars.)

Journal Club

Journal Club meets weekly during fall and spring semesters on Mondays at noon in the Entwisle Conference Room HH103D.

Discussion is lead by a student or resident with guidance from a faculty member. Occasionally a faculty member will be the discussion leader.

The Journal Club serves several important purposes:

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

Discussion Leaders

- Discussion leaders primarily consist of students and residents, but each semester there will be several weeks when the discussion leader is a faculty member.

The first discussion of the fall semester will be led by a faculty member and it will provide an orientation to Journal Club by example.

Faculty Mentors

- When a student is the discussion leader, the student will work with a faculty mentor to choose the paper, develop the brief presentation, and identify interesting points of discussion.
- Mentors will be selected from a list of faculty who express willingness to be Journal Club mentors, and who are informed about the goals and format of Journal Club.

Choice of papers to discuss

- Students should choose recent papers of interest that will lead to discussion. One good source for articles are those reported in the lay press.
- The faculty mentor should be fully involved in the choice of the paper.

Format

- The paper should be presented in 15 minutes, as it would be in a national meeting; 5 to 10 Power-Point slides at most.
- The paper would then be opened to discussion, led by the leader and using the points for review that are suggested in the handbook.
- Power point slides listing each review point could be used to facilitate the discussion.
- The leader should try to stimulate discussion by identifying some interesting issues that the paper gives rise to.
- Discussion leaders should end the discussion at 12:50 so that 1:00 classes can start on time.

TEACHING POSSIBILITIES

Teaching is expected of students in the doctoral program (see Ph.D. section). It is sometimes possible for M.S. students to also be involved, with faculty guidance, in teaching small groups of medical students in such areas as epidemiology, biostatistics and health care organization.

LIBRARIES

Departmental Library

The Department maintains a limited library of books and journals relevant to Epidemiology and Preventive Medicine. These collections are kept in several locations in the Department. The books and reference materials are kept in the Entwisle Conference Room (Rm. 103-D) and in the Trudy Bush Library (Room 132F). Books and journals specific to biostatistics are kept in the Howard Hall mezzanine area opposite Room 111.

Reference materials may not be checked out and may only be used in their designated locations. If making copies of any documents is necessary, please make sure to return the materials to their designated rooms as soon as possible after making the copies. This is necessary to make the journals available to all faculty and students who may need to use them. This is an honor system. Please be considerate of the needs of others in the department.

University Library

The Health Science/Human Services Library (HS/HSL) provides access to digital and print information and is also available to students for book checkouts and literature searches. The HS/HSL provides orientation for graduate students to the facility and resources; tours are arranged by contacting the library reference desk on extension 6-7996. Tours are also available during the week of the Graduate School Orientation. Classes are geared toward effective library research strategies and techniques in general, as well as specific classroom-oriented projects. Visit their Web site at <http://www.hshsl.umaryland.edu/> .

COMPUTER RESOURCES

Departmental Resources

The department encourages all students to own a computer. Computer Support staff can provide recommendations for computer specifications.

You will be set up with an e-mail account which accesses the DEPM Local Area Network (LAN). Two computer lab /study areas designed specifically for Department of Epidemiology and Preventive Medicine students are available in Howard Hall: one is on the mezzanine and the other is located within suite 135.

Computer Support staff are available to help with any questions or problems encountered on the LAN; contact Robin Moore in the academic office (6-8492) to place your request in the HelpStar system.

Upon completion of the program, or if you leave the graduate program for any reason, please notify Computer Support staff (David Simmons dsimmons@medicine.umaryland.edu) of the status and disposition of any computer files on the LAN.

University Resources

Students have access to the research and information commons area of the Health Sciences and Human Services Library with provides Windows-based machines. Access to e-mail, databases, the Web, word processing, desktop publishing, spreadsheet and other software is provided. Call 6-4763 for information.

There is also a microcomputer lab located in the Medical School Teaching Facility (MSTF) second floor, Computer Learning Center. Call 6-7227 for information.

As a new graduate student you automatically receive a "Umnet" account which entitles you to:

- A University of Maryland Baltimore e-mail address and mailbox;
- Free dial-up Internet access with local dial-up numbers in downtown Baltimore and College Park MD;
- Access to a wide variety of online databases and electronic reserves.

If students were admitted to the Graduate School at least 2 months prior to the start of the Fall term, their email accounts are automatically created based on information the graduate school administration has provided to the Health Sciences and Human Services Library (HS/HSL). Account information is given to students during the Graduate School Orientation.

If students were admitted shortly before the Fall term or for any other term they must complete an account application which is available on-line at <http://www.hshsl.umaryland.edu/cats/apps/>. Or applications may be obtained from the Computing Assistance Desk, located on the first floor of the Library. Applications must be printed out, signed and mailed to the Health Sciences and Human Services Library, 601 West Lombard Street, Baltimore MD 21201-1512. Applications may also be faxed to 410 706-8870.

To check the status of an account, call the Computing Assistance Desk at 410-706-7328.

SURFS - Student UseR Friendly System

SURFS is a web-based information utility that allows you to perform functions such as

- Access your enrollment records including your courses, grades and grade point average (GPA)
- Register for classes
- Request transcripts
- Submit name, address, telephone number and email address changes to university records
- Complete your application for diploma
- Complete enrollment verification and degree certification requests

Your SURFS account is automatically created for you at the time of admission or when your financial aid application is processed through that office. To activate and access your account, go to the SURFS website at <http://simsweb.umaryland.edu/> and follow the directions for accessing the system.

- To login, enter your UMID and PIN, and click on the Login button.
- UMID is your social security number or the nine-digit number assigned to you by the Graduate School.
- The Initial value of your PIN is your Date of Birth in the mmddyy format. To change your PIN, simply click on the "Change PIN" button or "Forget PIN?" button.

SURFS Accounts are managed by the Office of Records and Registration. If you have questions about or problems with SURFS, contact

Office of Records and Registration
111 S. Greene Street, Suite 103; 410 706-7480

Websites

The DEPM website, www.medschool.umaryland.edu/departments/epidemiology contains information about the department, including academic, residency and fellowship information as well as faculty research interests.

The graduate school website, www.graduate.umaryland.edu contains important information for graduate students.

HOWARD HALL ACCESS

These areas are open weekdays between 7:30 a.m. and 5:30 p.m. After hours, you must use your ID badge to gain access to the mezzanine level of Howard Hall. Access to the mezzanine and to the student computer lab is controlled. Students are provided with access information at the DEPM New Student Orientation.

PHOTO ID BADGES

ID application materials are available in the academic office. Please see Ms. Robin Moore or phone extension 6-8492.

STUDENT WORK SPACE

Computer lab/study areas are available to DEPM students on the Howard Hall mezzanine in room 119 and in Howard Hall suite 135.

TELEPHONES

The telephone in the mezzanine computer lab (410 706-4493) is available for students to use for local calls. Please provide this number to anyone trying to contact you.

MAIL

Mail for students will be delivered to the Academic Office where students can pick it up.

PHOTOCOPYING

Students are assigned an account number for photocopy machines located in the Department. Please see Debbie Welsh in the administrative office, Room HH109 (phone 6-7124) to have an account established. You will receive a monthly bill charged at the rate of .065 cents per copy.

PARKING

Each student must make his/her own parking arrangements through Parking Services. For information, call 410 706-6603 or visit the Parking and Commuter Services website at www.parking.umaryland.edu. Daily and off-hours parking is available in the Lexington Garage for \$4.00 per day or rooftop parking is available for \$20.00 biweekly (there is a wait list for rooftop parking). To be eligible for this parking, students must first purchase a hang-tag from the Parking Office at 622 West Fayette Street. The cost for the hang-tag is \$5.00 – bring your student ID and vehicle registration. Students may also purchase parking permits on-line.

GRADUATE SCHOOL INFORMATION

Information about University requirements, including the Graduate School Catalog, is available on-line at:

www.graduate.umaryland.edu

Graduate school forms for marking important student progress points are available on the website, at:

www.graduate.umaryland.edu/resources/forms

The University of Maryland Baltimore STUDENT ANSWER BOOK is available on-line at:

www.umaryland.edu/student/sab

The Graduate Student Association is a student-run organization comprising the graduate population of the University of Maryland. Representatives from participating programs throughout the Baltimore campus attend the GSA's monthly meetings and relay information back to their fellow students. GSA representatives are a great source of information on graduate programs, graduate student events, and the university. Julia Chan and Carrienne Jung are GSA representatives for our graduate program.

www.graduate.umaryland.edu/gsa/index.html

ACADEMIC OFFICE

The DEPM academic office is a student and faculty services unit located in Howard Hall, Suite 135. The academic office provides centralized services for students in the epidemiology and preventive medicine, toxicology and public health degree programs.

Katherine Pazdernik
Director, Academic Office
HH 134
Phone 410 706-3338
kpazdernik@epi.umaryland.edu

Teena Maultsby
Academic Program Specialist for Toxicology and MPH programs
HH132
Phone 410 706-0539
tmaults@epi.umaryland.edu

Robin Moore
Academic Coordinator for Epidemiology Graduate program and the
Preventive Medicine Residency program
HH132C
Phone 410 706-8492
rmoore@epi.umaryland.edu

Kimberly Moore
Administrator for Student Payroll and Human Resource matters
HH109
Phone 410 706-7867
kmoore@epi.umaryland.edu

Graduate Program Committee Membership

The GPC meets the second Thursday of every month except August.

Members:

Patricia Langenberg, PhD, Chair
Sania Amr, MD, MS
Mona Baumgarten, PhD
Douglas Bradham, DrPH
Jon Furuno, PhD
Laura Hungerford, PhD DVM, MPH
Jay Magaziner, PhD, MS, Hyg
Larry Magder, PhD
James Maguire, MD, MPH
J. Glenn Morris, Jr., MD MPH&TM
Denise Orwig, PhD
Katherine Pazdernik, BS
Jan Powell, PhD, MSc
Mary-Claire Roghmann, MD, MS
Michelle Shardell, PhD
Katherine Squibb, PhD
Julia Chan, Student Representative through January 2007
Marin Schweizer, Student Representative Beginning February 2007

GRADUATE DEGREES

The overall goal of the graduate degree programs is to educate and train scientists and public health practitioners in the disciplines of epidemiology, biostatistics, and preventive medicine and in the applications of these disciplines to health care research and practice and to public health. The Master's degree programs serve several different types of students, including 1) physicians who obtain the Master of Science degree as part of the preventive medicine residency; 2) other doctoral level students (often those working on campus) interested in acquiring clinical research skills; and, 3) non-physicians who want to begin a career in public health or health research. In fall 2005, a new Master's degree in biostatistics was implemented through a joint-degree program with UMBC.

The University of Maryland, Baltimore offers the only doctoral degree program in epidemiology at a public institution in the Baltimore/Washington/Delaware region. The degree program allows the student to acquire advanced knowledge, skills and experience in completing independent epidemiological research in a biomedical setting. Students may choose from two tracks: Molecular Epidemiology or Health Informatics.

Degree requirements for the Master's and PhD degrees are detailed on the following pages.

Graduate Degree Requirements in Epidemiology and Preventive Medicine

revised 10/20/05

Course Title	Credits	M.S. Regular	M.S. Residency	Ph.D. Regular	Ph.D. Molecular Epidemiology
PREV 600 Principles of Epidemiology	3	✓	✓	✓	✓
619 Biostatistical Computing	2	✓	✓	✓	✓
620 Principles of Biostatistics	3	✓	✓	✓	✓
648 Health Care Admin/Eval	2	✓	✓		
659 Observational Studies in Epi.	3	✓	✓	✓	✓
668 Environment/Occup. Health	3	✓	✓		
700 Cardiovascular Epi.	3			✓*	
701 Cancer Epidemiology	3			✓*	
703 Complex Disorders Seminar	2				✓
711 Genetic Epidemiology	3			✓*	✓
720 Statistical Methods in Epi.	4	✓	✓	✓	✓
721 Regression Analysis (half-semester course)	2			✓**	
723 Survival Analysis (half-semester course)	2			✓**	
747 Research Practicum I	3	✓	✓	✓	✓
748 Research Practicum II	2	✓	✓	✓	✓
749 Infectious Disease Epi ¹	3			✓*	
758 Health Survey Research Methods	3			✓	
780 Molecular Epidemiology	3			✓*	✓
801 Longitudinal Data Analysis (half-semester course)	2			✓**	
802 Statistics for Molecular Biology (half-semester course)	2			✓**	✓
803 Clinical Trials/Experimental Epidemiology	3			✓	
PH 610 Foundations of Public Health	4		✓		
<i>Molecular Biology course²</i>					
<i>Human Physiology Course³</i>		(✓)		(✓)	
ELECTIVE CREDITS	→	11	6	9 (minimum)	16 (minimum)
RESEARCH CREDITS	→	Optional	N/A	12 (minimum)	12 (minimum)
TOTAL CREDITS REQUIRED FOR DEGREE		36	36	62	58

Key: A= Annual B= Bi-annual

* Students must select three of the five courses marked with an asterisk.

** Students must select three of the four courses marked with a double asterisk.

¹ PREV 749 can be taken as an elective by non-PhD students for either 2 or 3 credits. PhD students must take the course for 3 credits.

² A molecular biology course is required of students who have not taken a molecular biology course as an undergraduate.

³ A course in human physiology is required for students with non-biomedical backgrounds.

**M.S. IN EPIDEMIOLOGY AND PREVENTIVE MEDICINE
(A Master's Thesis is Optional)**

The M.S. degree requires a total of 36 credit hours: 25 credit hours from required courses, with the remaining 11 credits from either elective courses (non-thesis option), or a thesis (6 credits) and elective courses. The degree can be completed in eleven calendar months. No more than 6 hours of Independent Study course credits will be accepted as part of the required 36 hours for the degree.

REQUIRED COURSES (25 credit hours)

PREV 600	Principles of Epidemiology	3 credits
PREV 620	Principles of Biostatistics	3 credits
PREV 668	Environmental/Occupational Health	3 credits
PREV 648	Health Care Administration and Evaluation	2 credits
PREV 619	Biostatistical Computing	2 credits
PREV 659	Observational Studies in Epidemiology	3 credits
PREV 720	Statistical Methods in Epidemiology	4 credits
PREV 747	Research Practicum I	3 credits
PREV 748	Research Practicum II	2 credits

Note: A course in human physiology is required for students with non-biomedical backgrounds.

M.S. IN CLINICAL RESEARCH

The Master of Science degree 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. The curriculum provides students with a thorough understanding of clinical research methodology, biostatistics, and research ethics and will provide participants with the necessary skills to conduct independent clinical research, to teach, and to mentor others. Graduates will have gained the ability to identify important clinical questions, develop research protocols, generate pilot data, conduct clinical investigations, analyze and write the results in a publishable form and develop and submit grant proposals. The program will prepare students to be competitive in seeking external support and be knowledgeable in the complex issues associated with conducting sound clinical research.

A total of 36 credits is required for the degree which can be completed on a part-time basis within two years. Students may select from four concentration areas:

Epidemiologic Research
Outcomes/Health Services Research
Human Genetics
Research Ethics

Mentored Research Project

The completion of a research project in the student's area of research interest is one unique aspect of the program. The purpose of requiring this project is to provide the student with a comprehensive awareness of the research experience from the formulation of the research question to the design and conduct of the research protocol, to the analysis and presentation of the findings of the study, to finally the publication of the research results.

Students can fulfill this requirement through a Master's thesis or a two-semester course, Research Practicum. Both mentors and students will participate in a formal mentoring program to optimize the mentor-mentee relationship. It is expected that, for most students, the mentoring and training activities invested in the master's thesis ultimately will result in a funded research project.

The clinical research program will provide participants with the necessary skills to conduct independent clinical research, to teach, and to mentor others. Graduates will have gained the ability to identify important clinical questions, develop research protocols, generate pilot data, conduct clinical investigations, analyze and write the results in a publishable form and develop and submit grant proposals.

Course Requirements

CORE COURSES (17 credits)

PREV 600 Principles of Epidemiology (*Credits: 3*)

PREV 620 Principles of Biostatistics (*Credits: 3*)

PREV 720 Statistical Methods in Epidemiology (*Credits: 4*)

PREV 619 Biostatistical Computing (*Credits: 2*)

PREV 706 Research Informatics: Data Management in Research (*Credits: 2*)

PREV 617 Design, Implementation and Reporting of Clinical Research Studies (*Credits: 2*)

CIPP 909 Responsible Conduct of Research (*Credits: 1*)

M.S. IN CLINICAL RESEARCH, continued

COURSEWORK	Credit hours	Concentration			
		Epidemiologic Research	Outcomes/ Health Services Research	Human Genetics	Research Ethics
CORE SUBTOTAL	17	17	17	17	17
PREV 659 Observational Studies in Epidemiology	3	√			
PREV 803 Clinical Trials and Experimental Epidemiology	3	√ ¹			
PREV 648 Health Care Administration and Evaluation	2		√		
PREV TBA Introduction to Outcomes Research (course is under development)	3		√ ²		
PREV 707 Cost-Effectiveness in Prevention and Treatment	3		√ ²		
PREV 758 Health Survey Research Methods	3	√ ¹	√ ²		
HGEN 601 Human Genetics I	4			√	
PREV 711 Genetic Epidemiology	3			√ ³	
MPHYS 750 Current Topics in Molecular Medicine	2			√ ³	
MMCB 716 Applied Bioinformatics	3			√ ³	
PHIL 650 Moral Theory	3				√
PREV TBA Introduction to Research Ethics	3				√
PREV 638 Ethical Issues in International Health	3				√
CORE AND CONCENTRATION SUBTOTAL		23	25	24	26
Thesis Research or PREV 747/748 Research Practicum I and II	5-6	28-29	30-31	29-30	31-32
Electives to total 36 credits		7-8	5-6	6-7	4-5
TOTAL	36	36	36	36	36

¹ one of these two courses is required

² two of these three courses are required

³ one of these three courses is required

MASTER OF SCIENCE IN STATISTICS, BIOSTATISTICS TRACK
Joint Program with UMBC

The Department of Mathematics & Statistics at the University of Maryland, Baltimore County (UMBC), and the Department of Epidemiology and Preventive Medicine (DEPM) at UMB are collaborating in a joint M.S. track in Biostatistics.

The 30-credit, two-year program provides students with a mathematical statistics foundation through course work at UMBC and a medical applications exposure through course work and seminars in DEPM. A capstone project is required and may be completed with faculty at either campus.

REQUIRED COURSES (21 credit hours) *

STAT 651 Basic Probability	3 credits
STAT 653 Basic Mathematical Statistics	3 credits
PREV 600 Principles of Epidemiology	3 credits
STAT 601 Applied Statistics I	3 credits
STAT 699/PREV 789 Capstone Project Course	3 credits
Choose two of three courses:	
STAT 602 Design of Experiments	3 credits
STAT 603 Categorical Data Analysis	3 credits
STAT 619 Biostatistics/Principles and Design	3 credits

For the capstone project course, the student works closely with a faculty member on a project that can involve a sophisticated data analysis, a simulation study, a review of the literature, statistical software development, or other activities related to biostatistics.

Students are also required to attend a monthly biostatistics seminar and pass a comprehensive examination at the end of the first year.

The remaining 9 credits of course work would be chosen from a variety of electives with at least one course being taken in DEPM.

* Courses with the prefix STAT are taught at UMBC; those with the prefix PREV are taught in DEPM

Dual Degree Program in Gerontology & Epidemiology

The epidemiology and preventive medicine master of science degree and the gerontology doctoral programs in the Department of Epidemiology and Preventive Medicine Department offer a dual-degree in which gerontology doctoral students may simultaneously earn a master of science degree in epidemiology and preventive medicine with their Ph.D. degree in gerontology.

This program is available to students who are accepted into the gerontology Ph.D. program and remain in the program in good standing. 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 Ph.D.-M.S. program upon admission should indicate so in their application letter.

Requirements for the dual-degree program

Methods (15 credits)

- GERO750 -Theory/Methods I (3)
- GERO751- Theory/Methods II (3)
- PREV600 - Principles of Epidemiology (3)
- PREV659 - Observational Studies in Epidemiology (3)
- PREV758 - Health Survey Research Methods (3)

GERO Core (15 credits)

- GERO614 – Biology of Aging (3)
- GERO681 – Epidemiology of Aging (3)*
- GERO700 – Sociocultural Gerontology (3)
- GERO703 – Policy Analysis of Aging Issues (3)
- GERO786 – Psychological Aspects of Aging (3)

Statistics (13 credits)

- PREV620 – Principles of Biostatistics (3)
- PREV619 - Biostatistical Computing (2)
- PREV720 – Statistical Methods in Epidemiology (4)
- PREV721 – Regression Analysis (2)
- PREV 723 – Survival Analysis (2)

Other requirements

- PREV803 – Clinical Trials (3)
 - Advanced elective in epidemiology (3)
 - Dissertation research (12 credits)
 - CIPP909 Responsible Conduct of Research (no credit)*
-

* With an added day of ethics in aging research

Dual Degree Program in Pharmacy & Epidemiology

The epidemiology and preventive medicine master of science degree program and the Pharmaceutical Health Services Research Graduate Program offer a dual-degree in which PHSR doctoral students may simultaneously earn a master of science degree in epidemiology and preventive medicine with their Ph.D. degree in Pharmaceutical Health Services Research.

This program is available to students who are accepted into the PHSR doctoral program and remain in the program in good standing. 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 Ph.D.-M.S. program upon admission should indicate so in their application letter.

Requirements for the dual-degree program

Methods (6 credits)

PHSR 701 - Research methods I (3)

PHSR702 - Research methods II (2/3)

Statistics (10 credits)

PREV620 - Principles of biostatistics (3)

PREV720 - Statistical methods in epidemiology (4)

PREV721 – Regression Analysis (2)

PREV 723 – Survival Analysis (2)

PHSR Core (15 credits)*

PHSR610 - Health care system (3)

PHSR620 - Social behavioral (3)

PHSR650 - Pharmaceutical econ (3)

PHSR670 - Health education (3)

PHSR 704 - Pharmacoepidemiology (3)

Epidemiology Core (15 credits)**

PREV600 - Principles of epidemiology (3)

PREV659 - Observational studies in epidemiology (3)

PREV803 - Clinical trials/experimental epidemiology (3)

Advanced epidemiology electives (6)

Other requirements

PREV619 Biostatistical computing (2 credits)

Seminar (present 3 times, 1 credit each)

Dissertation research (12 credits)

* The PHSR core is in the process of being reduced to 4 required courses.

** While these courses can replace the cognate electives for students in the pharmacoepidemiology track, dual-degree students in other cognates/tracks must take these courses in addition to their cognate electives.

UMB Graduate School GUIDELINES FOR MASTER'S THESIS

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 generating 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. The thesis must be submitted through the Graduate School, which appoints an examining committee, schedules a formal defense and keeps copies of the thesis for its records and for publication in Thesis Abstracts. Copies of the forms needed for each step for the degree and for preparing a thesis are contained in the "Instructions for Preparing Master's Theses and Doctoral Dissertations" which is available on the Graduate School Website.

Procedures

- A. Any student interested in proposing Master's Thesis research should first meet with the graduate program director to discuss the student's interests and preparation for initiating the research.
- B. Formulation Stage: General Research Plan for Master's Thesis The purpose of the General Research Plan 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.
 - 1) The student should select an area of research for the Master's thesis through discussions with his/her academic advisor and other faculty members. Students in

the Clinical Track will also consult their clinical mentor. The student will then complete the brief General Research Plan (10 pages or less) in which succinct, preliminary information about the problem, the methods to be utilized and the significance and feasibility of the research are addressed. Students in the Regular Track will identify and obtain approval of a DEPM faculty member as Thesis Committee Chair. Students in the Clinical Track will identify co-chairs, a faculty member in DEPM and a UMB faculty member in the student's clinical department. The student, in consultation with the committee chair(s) will identify potential committee members for his/her research committee to oversee the execution of the entire thesis. Potential committee members are also proposed as part of the submission of the General Research Plan for review and final approval.

- 2) Submit the General Research Plan along with the names *and signatures* (to indicate their approval of the research plan and willingness to work with the student) of recommended members for the dissertation committee to the Academic Coordinator for presentation to the GPC for its approval at least one week prior to the committee meeting. The GPC will notify the student of its approval or disapproval of the General Research Plan and of any change in dissertation committee membership from that proposed by the student.
- 3) The Chair of the Thesis Committee should attend the GPC meeting when their advisee's GRP is discussed or they may delegate this to a member of the thesis committee. The General Research Plan 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.

The Chairperson of the thesis committee must be a full-time, on-site member of the UMB faculty with a primary academic appointment in the Department of Epidemiology and Preventive Medicine at the rank of assistant professor or above and 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 a 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.

Master's Thesis Proposal

- (1) Submission for approval:
 - a. After approval of the General Research Plan, the student will develop a full Thesis Proposal with the guidance of his/her thesis committee. The proposal must follow the NIH grant proposal format (PHS Form 398: Background and Significance, Objectives and Specific Aims, Preliminary Work (if appropriate), Experimental Design and Methods, Human Subjects, Literature Cited. A thorough review of the relevant literature that forms the background for the proposed thesis should be included.
 - b. Each member must then sign the Approval of Master's Thesis Proposal to indicate that they have: (1) approved the proposal, (2) agreed that the proposed work is feasible, and (3) recommended that the research proceed as planned by the student. This form must be filed with the academic coordinator by the student's Committee.
 - c. The student will be informed by the chair(s) of his/her Thesis Committee when the proposal has been approved and work on the thesis can proceed.
- (2) Completion of the Master's Thesis:
 - a. The student is responsible for all activities necessary to complete the thesis. The student is expected to: (1) obtain Institutional Review Board (IRB) approval, if needed; (2) design required data forms; (3) perform coding for data entry and programming for statistical analysis. The student is expected to work under close supervision of, and in consultation with, his/her committee. The chairperson(s) will serve as liaison with the GPC to keep the latter abreast of the student's progress and will report any problems with or redirection of the work.
 - b. The thesis should be organized in the format of a published scientific paper: Background, Methods, Results, Discussion. Appendices should be used for material not central to the primary components of the report.
 - c. After the thesis receives final approval by the Thesis Committee and the revisions have been made to the project, the student will make an oral presentation (thesis defense) of the work to the Departmental faculty and students.
 - d. See "Instructions for Preparing Master's Theses and Doctoral Dissertations" on the Graduate School Website. The original and one copy of the final Master's Thesis, including the committee members' signatures indicating approval of the project, will be filed with the academic coordinator.
 - e. After the Departmental presentation and the filing of copies of the final Master's Thesis, the student will receive six hours of academic credit for completion of the thesis. The student will be given a grade by the Chairperson(s) of the Thesis Committee, in consultation with the other committee members.

Ph.D. DEGREE INFORMATION

Doctoral Student Funding

The department will assure at least two years of support for PhD students who are admitted with an offer of financial support through GRA awards, training grant funds or departmental funds. It is expected that the student will find support beyond the second year through departmental research projects, training grants or individual grants. Entering PhD students who receive departmentally awarded GRAs will be assigned to three mentored research rotations during the first year. In their second year, all PhD students will be expected to identify a research advisor for further research in an area of interest that would be expected to help prepare the student for a dissertation research project. Descriptions of rotation opportunities are available in the academic office.

Departmental Requirements

Doctoral students are advised that they must meet all requirements of the University of Maryland Graduate School and of the Department of Epidemiology and Preventive Medicine (DEPM) to obtain a Doctor of Philosophy in Epidemiology degree. They should refer to the written procedures both here and on the Graduate School Website to ensure that they are doing so. Copies of the forms needed for each step for the degree and for preparing a dissertation are available on the Graduate School Website. The following are Departmental requirements.

Research (Minimum of 12 credit hours)

PREV 899 Dissertation Research Independent doctoral research that fulfills all doctoral dissertation requirements. The investigation must be on a substantial epidemiological question, designed to test relevant hypotheses with the most appropriate epidemiological and biostatistical methods, and completed at a level that is worthy of publication.

Elective Courses

All courses offered by the department are eligible for elective credits. It is expected that the doctoral candidate will develop at least one content area of concentration in some specialization of interest using elective credits. If students plan to take courses outside the department to apply to their degree, they must obtain permission from their academic advisor and the graduate program director.

Teaching Requirement

In order to fulfill the DEPM requirements for a Ph.D. degree, students are required to teach for one semester in a departmental course. This teaching experience will generally involve being a teaching assistant or lab instructor for a graduate course, although other teaching experiences may be acceptable with approval of the Graduate Program Committee chairperson. The course in which the student provides teaching assistance or lab instruction must be one that the student has previously taken. Matching of students and teaching opportunities will be coordinated by the academic office and will take place before the start of each semester. The matching process will take into account student preferences, student plans and progress, faculty preferences and class size.

Seminar Attendance Requirement

Ph.D. students are required to attend fifty percent of offered seminars during each of their first two years in the program. Part-time students will meet the same requirement, but may spread this requirement over a longer time period. The requirement becomes effective for all new students entering the PhD program in Fall 2002.

Ph.D. Examinations

The Doctor of Philosophy degree is the highest degree awarded by the University and is granted upon sufficient evidence of high attainment in scholarship and the ability to engage in independent research. The Examination Policy follows:

Ph.D. Program Three-Exam System

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 epidemiology and biostatistics. In addition, they must demonstrate their ability to apply epidemiologic reasoning to critique existing research, and to develop and implement solutions to new research problems.

Examination #1

Comprehensive Examination (An Exam Committee is appointed annually to administer the exam)

- taken after the third semester of full-time course work
- offered every year prior to January 31
- reading list distributed by September 30

Exam Structure is determined by the Examination Committee of the GPC and may include:

- two components:
 - written (includes computer data analysis); and
 - oral
- open or closed book

Exam Grading:

- Pass
- Fail with option to retake the following January
- Fail with no continuation in the program

Examination #2

The Proposal Defense, an oral defense of the dissertation proposal to faculty and students in the Department; administered by the candidate's Doctoral Committee.

- taken after Proposal is approved by Dissertation Committee
- graded by Dissertation Committee as Pass or Fail

Examination #3

Dissertation defense is administered by the Dissertation Examination Committee

PROGRESS TO PhD DEGREE

Student completes equivalent of three full-time semesters of course work



Student passes the Comprehensive Exam (January after first 3 full-time semesters)



**Within one year of passing the examination,
Student submits General Research Plan with proposed committee membership to
Graduate Program Committee**



**GPC reviews the General Research Plan to approve both the scope and feasibility
of the proposal and the appropriateness of the committee membership**



**When General Research Plan is approved, the student is
ADMITTED TO CANDIDACY**

(Students with Graduate Research Assistantships (GRAs) become eligible for the Level II stipend when they achieve candidacy. Payment of the higher stipend amount begins at the start of the subsequent contract year.)



**Within one year of attaining candidacy status,
Student completes the dissertation proposal (using the NIH format)**



**Student defends the Proposal
Defense has 2 components: a public presentation, followed by
a closed session in which the committee questions the student.**



Student completes the proposed research and writes the dissertation



Student defends the dissertation



PhD Degree awarded

PHD DEGREE IN EPIDEMIOLOGY

Course Requirements

The following courses are required with a grade of B or above unless there is a specific written waiver which will be kept in the student's academic file. No more than 6 credits of Independent Study are accepted towards the degree.

Required Courses

PREV 600	Principles of Epidemiology	3
PREV 619	Biostatistics Computer Lab	2
PREV 620	Principles of Biostatistics	3
PREV 659	Observational Studies in Epidemiology	3
PREV 720	Statistical Methods in Epidemiology	4
PREV 747	Research Practicum I	3
PREV 748	Research Practicum II	2
PREV 758	Health Survey Research Methods	3
PREV 803	Clinical Trials & Experimental Epidemiology	3

Choice of 3 courses from the following:

PREV 700	Cardiovascular Disease: Epidemiology and Prevention	3
PREV 701	Cancer Epidemiology	3
PREV 711	Genetic Epidemiology	3
PREV 749	Infectious Disease Epidemiology	3
PREV 780	Molecular Epidemiology	3

Choice of 3 courses from the following:

PREV 721	Regression Analysis	2
PREV 723	Survival Analysis	2
PREV 801	Longitudinal Data Analysis	2
PREV 802	Statistics for Molecular Biology	2

ELECTIVE COURSES

A minimum of 9 elective credits, forming a core content area of expertise must be completed.

Note: A 2-3 credit course in human physiology is required for students without a biomedical background.

PHD TRACK IN MOLECULAR EPIDEMIOLOGY

Revision approved by GPC 10/13/05.

The track 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 human health problems. The recent, striking advances made in genomics have added a new dimension to the understanding of risk factors for illness and disease transmission/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 molecular epidemiology track has been designed to allow students the ability to maintain as much flexibility in the program as possible, while still retaining the essential core courses in epidemiology. Students in the molecular epidemiology track are encouraged to use their elective time (16 credit hours) to develop a focus in one of three areas:

- a. Microbial molecular epidemiology;
- b. Epidemiology of complex diseases; or
- c. Toxicology.

The required courses that constitute the program's core consist of a mix of laboratory-based and classroom-based courses, and include molecular and genetic epidemiology. The elective courses include courses in epidemiology that lay a foundation of basic knowledge as well as identify the state of science in that area.

Note: Students without a molecular biology background will be required to complete a molecular biology course.

Required Courses (30 credits)

PREV 600	Principles of Epidemiology	3
PREV 619	Biostatistical Computing	2
PREV 620	Principles of Biostatistics	3
PREV 659	Observational Studies in Epidemiology	3
PREV 703	Complex Disorders Seminar	2
PREV 711	Genetic Epidemiology (evolution, linkage analysis, informatics)	3
PREV 720	Statistical Methods in Epidemiology	4
PREV 747	Research Practicum I	3
PREV 748	Research Practicum II	2
PREV 780	Molecular Epidemiology	3
PREV 802	Statistics for Molecular Biology	2

Elective Courses (minimum of 16 credits)

PREV 704 *	Molecular Epidemiology Practicum (rotation through labs)	3
PREV 749	Infectious Disease Epidemiology	3
PREV 803	Clinical Trials and Experimental Epidemiology	3
HGEN 601	Basic Human Genetics I	4
MMCB 716	Applied Bioinformatics	3
MMIC 703	Basic Parasitology	3
MMIC 701	Principles of Bacterial Pathogenesis	3
MMIC 704	Basic Virology	3
MMIC 720	Molecular Bacterial Pathogenesis and Epidemiology	3
MPHY 612 **	Physiology of Reproduction	2
MPHY 750	Molecular Medicine	3
TOXI 601	Advanced Toxicology I	3
TOXI 602	Advanced Toxicology II	3
TOXI 604	Biochemical Pharmacology	3
TOXI 615	Toxic Cell Injury	2

* Required of students who do not have adequate experience in laboratory methods

** Prerequisites: MPHY 601 or 644 and 645, or equivalent.

Requirements for MD/PhD

Course Title	Credits	Ph.D. Regular	Ph.D. Molecular Epidemiology
PREV 600 Principles of Epidemiology FALL	3	✓	✓
619 Biostatistical Computing SPRING	2	✓	✓
620 Principles of Biostatistics FALL	3	✓	✓
659 Observational Studies in Epi.	3	✓	✓
711 Genetic Epidemiology OR FALL	3	✓*	✓
780 Molecular Epidemiology SPRING (B)			
720 Statistical Methods in Epi. SPRING	4	✓	✓
721 Regression Analysis (half-semester course) FALL	2	✓**	
723 Survival Analysis (half-semester course) FALL	2	✓**	
747 Research Practicum I SPRING	3	✓	✓
748 Research Practicum II SUMMER	2	✓	✓
758 Health Survey Research Methods SUMMER	3	✓	
801 Longitudinal Data Analysis (half-semester course) SPRING	2	✓**	
802 Statistics for Molecular Biology SPRING (B) (half-semester course)	2	✓**	✓
803 Clinical Trials/Experimental Epidemiology SPRING	3	✓	
RESEARCH CREDITS	→	12 (minimum)	12 (minimum)
TOTAL CREDITS REQUIRED FOR DEGREE		47	37

Key: A= Annual B= Bi-annual

* Students must select one of the two courses with an asterisk.

** Students must select three of the courses marked with a double asterisk.

Students are also required to complete at least 2 research rotations. Rotations completed as part of the M.D./Ph.D. program will fulfill this requirement as long as the rotations were conducted with faculty members in the Program in Epidemiology.

DOCTORAL DISSERTATION

Dissertation Procedures

The following steps are intended to assure that the student's dissertation work is reviewed incrementally and systematically by the faculty so that any difficulties can be attended to early and progress can be sustained by the student as the work moves from the

General Research Plan (also referred to as the pre-proposal) to a
Dissertation Proposal and then to the
Dissertation

1. Choose a topic and an initial research plan for the dissertation with the advice and consultation of the academic advisor, other faculty and others knowledgeable in the subject area. Identify and obtain approval of a dissertation advisor who will chair the dissertation committee.
2. Assemble the Dissertation Committee following the membership requirements of the Graduate School and the DEPM PhD program.

The doctoral examination 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. At least one committee member must be from outside the program or department. The Department strongly recommends that one member be a biostatistician and that at least one member have expertise in epidemiologic methods. The committee chair must hold a primary appointment in DEPM.

3. Prepare the **General Research Plan for Dissertation**
4. Submit the General Research Plan along with the names *and signatures* (to indicate their approval of the research plan and willingness to work with the student) of recommended members for the dissertation committee to the Academic Coordinator for presentation to the GPC for its approval at least one week prior to the committee meeting. The GPC will notify the student of its approval or disapproval of the General Research Plan and of any change in dissertation committee membership from that proposed by the student.
5. Develop and defend the full Dissertation Proposal working with the dissertation committee and using the recommended dissertation proposal guidelines below. When the student's dissertation committee agrees that the proposal is ready, the student may schedule the Dissertation Proposal Defense (Examination #2).

Dissertation Proposal

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 proposal is an important document outlining the student's dissertation research, and its acceptance implies that the faculty and student agree on the plan of study. While important, the proposal is not an end in and of itself and 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 thesis.

The student writes the Dissertation Proposal under the direction of his/her dissertation committee.

Proposal Format

The format for the Dissertation Proposal is modeled after the Public Health Service grant application format for research proposals. The dissertation proposal will ordinarily be 25 or more pages in length, and should be in the hands of the student's dissertation committee at least two weeks before the Proposal Defense.

When the dissertation committee agrees that the full proposal is complete, the student will arrange to conduct a **Dissertation Proposal Defense (Examination #2)**. 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 two members of the GPC must be present at the Proposal Defense. *The two GPC members are in addition to any GPC members who may be on the student's dissertation committee.* All committee members must sign the face page of the Dissertation Proposal to indicate that they have read and that they approve of the full proposal. With this approval, the dissertation committee is also signifying its 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 as well as to the GPC Chair and the two additional GPC members required to be present at the proposal defense. The student will provide the academic program coordinator with a signed copy of the face page of the Proposal. The academic program coordinator will schedule a room and distribute announcements to faculty and students.

The Dissertation Proposal Defense is conducted as an oral defense of the dissertation proposal and is administered and graded by the student's dissertation committee. The defense is conducted in a workshop format to provide constructive criticism for the proposed dissertation work while there is still opportunity to make modifications or to even change the topic or research design before an undue investment of effort has been made by the student. The defense is graded on a pass/fail basis (*Appendix E*). The dissertation committee will advise the student of any changes that must be made before the student can proceed to work on the dissertation.

The student will work with the Dissertation Committee, as needed, to assure the completion of the dissertation. It is the student's responsibility to contact the Dissertation Committee regularly to discuss progress and plans related to the dissertation, to keep them informed and seek their input as well as that of other faculty members to strengthen the work and obtain adequate guidance to complete a defensible dissertation.

Original Data Collection Requirement

The purpose of the doctoral dissertation is for a student to successfully complete an original, scholarly research project that demonstrates an unconditional ability to conduct independent research. Most doctoral dissertations will be based on an unanswered, original question and the student will collect most or all related data. In some cases, a doctoral research project will be approved using already collected data. Because of the importance in epidemiologic research of planning for and collection of original data to answer questions, the student will be required to document that such experience has been obtained. The experience does not have to be obtained in a formal course or involve academic credit. The chairperson of the Dissertation Committee will determine when this requirement has been met.

Manuscript-Based Dissertations

As an alternative to the traditional dissertation format, doctoral students have the option of submitting a manuscript-based dissertation. The manuscript-based dissertation must meet the following criteria: (1) It must include a minimum of two manuscripts, linked to a common theme; (2) The student must be first author on both manuscripts; (3) The dissertation may not include a paper published prior to the General Research Plan being submitted to the Graduate Program Committee; (4) The manuscripts must be suitable for publication in a peer-reviewed scientific journal, as determined by the student's dissertation committee; and (5) The dissertation must meet all criteria (except those related to presentation format) specified elsewhere in the Student Handbook.

The dissertation must be organized as follows:

- A. The first chapter should be a comprehensive critical literature review.
- B. The second chapter should be a complete and detailed description of the study methods.
- C. The third and fourth chapters should be the manuscripts, with a transitional short chapter relating one to the other and to the overall theme. (Additional chapters and transitional sections should be included if there are more than two manuscripts.)
- D. The final chapter should integrate and discuss the findings reported in the manuscripts. It should include a discussion of the conclusions drawn from the research, and should make recommendations for further studies.
- E. The dissertation should include an appendix that includes all tables and results deemed necessary to fully understand the data.

Prior to submission for publication, manuscripts must be reviewed and approved by members of the dissertation committee. The student will be deemed to have completed the dissertation when the two manuscripts have been submitted to peer-reviewed scientific journals. (If more than two manuscripts are included in the dissertation, two of them must be submitted for publication to fulfill the requirement.)

Dissertation Defense The Graduate School requires the oral defense of the dissertation before a committee approved by the Dean of the Graduate School. Nomination of the members of the committee will occur six months prior to the projected date of the final oral dissertation defense. The Dean of the Graduate School will select a member of the committee as her/his representative. Two members should be designated as "Readers". At least two weeks (10 working days) prior to the date of the Final Oral Defense Examination, these individuals and the Chairperson of the committee will certify that the dissertation is ready to be defended. For any proposed examiners who are not members of the UMB graduate faculty, indication of professional affiliation and credentials, and a curriculum vitae must be provided with the Graduate School form which requires the date, time and place of the examination for announcement to other departments.

When the Dissertation Committee decides the dissertation is ready for defense, (examination #3), members will sign the Certification of Completion of the Doctoral Dissertation form that indicates the dissertation is defensible. (Refer to the Graduate School Webpage for specific steps and actions required of the student.)

The student will defend the dissertation before the Dissertation Examination Committee in accordance with University procedures. The GPC Chair must be present at the defense. The

academic program coordinator will schedule a room and distribute announcements. The defense is open to all members of the Graduate Faculty. Only members of the committee may examine the candidate and vote.

After the defense, the student will modify the dissertation (if approved) as directed by the Dissertation Examination Committee and comply with any remaining University regulations.

COURSE DESCRIPTIONS AND PREREQUISITES

For Graduate Degrees in Epidemiology and Preventive Medicine and MPH Core Courses

Epidemiology and Preventive Medicine Courses

PREV 600 Principles of Epidemiology presents a comprehensive treatment of the concepts and methods of chronic disease epidemiology. Topics include the classification of statistical associations and methods of distinguishing between causal and non-causal associations. Case-control, cohort and experimental studies are considered in detail. There are also presentations by students of epidemiological papers, including those linking lung cancer to cigarette smoking. *Prerequisites: PREV 620 previously or concurrently and consent of instructor.* 3 credits
Course Master: M. Baumgarten, PhD

PREV 611 Disease Modeling in Epidemiology Mathematical models are an important tool for understanding infectious disease epidemics. Each student in the course will develop and analyze a basic mathematical model on a system of their choice. In addition, we will introduce students to the core theory for infectious diseases, teach some basic skills needed to read a theory paper, and cover special topics selected by the students. *Prerequisites: PREV 600 and PREV 620.* 3 credits
Course Masters: L. Hungerford, PhD and D. Hartley, PhD

PREV 617 Design and Implementation of Research Studies (Grant Writing) During the semester students will select a research topic, develop a research plan, and write a grant application in appropriate format for submission to a funding agency. Grant sections, as they are written, will be presented to the class by the students for critique and discussion. As part of this process, students will consider research strategy and requirements of funding agencies; gain familiarity with various grant formats; discuss ethical issues in study design; and consider the practical aspects of data management. Student evaluation is based on class presentations and the final grant application. *Prerequisites: Enrollment limited to MS Clinical Research track students.* 2 credits
Course Master: G. Morris, MD, MPH&TM

PREV 619 Biostatistical Computing provides the student with comprehensive experience in the application of epidemiological and biostatistical methods available in the Statistical Analysis System (SAS). Hands-on experience in weekly workshops is gained by conducting analyses of existing data designed to answer a research question. *Prerequisites: PREV 620 previously and PREV 720 concurrently, or consent of the instructor.* 2 credits
Course Master: M. Zhan, PhD

PREV 620 Principles of Biostatistics is designed to develop an understanding of statistical principles and methods as applied to human health and disease. Topics include: research design; descriptive statistics; probability; distribution models; binomial, Poisson, and normal distribution; sampling theory and statistical inference. *Prerequisites: Knowledge of college algebra required. Calculus recommended.* 3 credits
Course Masters: C. Brown, PhD and L. Magder PhD

PREV 627 Vaccinology Vaccinology is an emerging science that deals with all aspects of the development and implementation of vaccines and vaccination programs. The Center for Vaccine

Development at the University of Maryland is world famous research center that creates vaccines in the laboratory, then tests these vaccines at all levels, including pre- and post-licensure field studies. This course is taught by the faculty of the Center for Vaccine Development and experts from other institutions. The full range of issues in vaccinology is covered, including the current status of vaccines and vaccination programs. There is particular emphasis on policy in vaccine implementation.

Prerequisites: none. 2 credits

Course Master: M. Trucksis, MD, PhD

PREV 629 Current Perspectives in Women's Health Research This course will examine interdisciplinary research in women's health to elucidate the changes across the life span which affect the interplay of women's psychosocial, behavioral, and psychological health. Models of clinical preventive services, community-based interventions, and the management of common chronic conditions, which address the needs of diverse women, improve functional health outcomes, and extend active life expectancy will be presented. We will go beyond the individual risk factor approach to health and disease, and apply models of health and health behavior change to study the sociocultural context and processes underlying the health of diverse populations. *Prerequisites: none. 3 credits*

Course Master: R. Royak-Schaler, PhD

PREV 631 Molecular Epidemiology of Infectious Diseases: Methodological Approaches and their Practical Applications This course consists of lectures and laboratory rotations dealing with the theoretical concepts and practical applications of methodologies and approaches commonly used in molecular epidemiology. An historical overview of typing methodologies will be part of the course, and it will be presented on the context of ongoing advancements in biological sciences and technology. The pros and cons of various typing methodologies will be explained, and their comparative suitability for specific epidemiological investigations will be discussed. The students should have a background in the biological sciences, and a basic understanding of the structure and organization of prokaryotic genomes will be particularly helpful. The course will be designed to guide the students in a stepwise, easy-to-understand manner, from basic principles of strain genome organization to more complex issues of how to utilize that knowledge during epidemiological investigations. *Prerequisites: A basic knowledge of microbiology. Knowledge of basic molecular biology techniques will be advantageous, but is not required. Also, the PREV 780 course (taken previously or concurrently) will be helpful. 1 credit*

Course Master: A. Sulakvelidze, PhD

PREV 633 Legal and Regulatory Issues in Clinical Research The course will be co-taught by faculty from the School of Medicine and the School of Nursing. The course is required for the Master of Science in Clinical Research in the School of Medicine and the Master of Science in Clinical Research Management in the School of Nursing. This mixture of students will promote the multidisciplinary interactions integral to successful clinical research. *Prerequisites: Health professional degree and clinical research experience. 1 credit*

Course Master: M. Roghmann, MD, MS

PREV 634 Introduction to Health Informatics The course provides a comprehensive introduction into the field of health informatics, combining perspectives into medicine, public health, social science and computer science. Particular attention is given to diverse use of computers and information technology in healthcare and the biomedical sciences, including specific applications and general methods, current issues, capabilities and limitations of health informatics. Health Informatics studies the organization of medical information, the effective management of information using computer technology, and the impact of such technology on medical research, education, and patient care. The field explores techniques for assessing current information practices, determining the information

needs of healthcare and biomedical research professionals and other workers and patients, developing systems using computer technology, and evaluation of the impact of these systems. The course covers a wide range of health informatics applications relevant for healthcare delivery organizations, government agencies, biomedical researchers and commercial entities. The course provides an overview of major health informatics techniques aimed to optimize the use of information in order to improve the quality of healthcare, reduce cost, provide better education for providers and patients, and to conduct medical research more effectively. *Prerequisites: Some experience with computers and a passing familiarity with biology and/or medicine will be useful.* 4 credits
Course Master: TBA

PREV 635 Topics in Health Informatics 1 credit The goal of this course will be to provide students with a systematic review and evaluation of recent scientific publications in the major health informatics areas. The major areas pertinent to the development and assessment of computer applications for health care and biomedicine include 1) health and clinical management; 2) computer-based patient records; 3) health information systems; 4) medical signal processing and biomedical imaging; 5) decision support, knowledge representation and management; 6) computer-assisted education and consumer informatics; 7) bioinformatics. The course will be in a seminar format and will consist of the evaluation of assigned readings of recent literature which may be relevant to the field of medical informatics and which might be expected to lead to further computer use in medicine and biology. This format will provide an opportunity to learn to critically evaluate medical informatics literature and to develop oral presentation skills essential to function as a leader in medical informatics projects. *Prerequisites: None.* 1 credit
Course Master: TBA

PREV 637 Ethical Issues in Clinical Research This course begins with the birth of contemporary bioethics in famous research scandals and ends with some current problems on the cutting edge of scientific research ethics. In between, we shall examine the regulatory structure designed to curb the abuse of patient/subjects; specifically, this will consist of the role and functions of institutional review boards (IRBs). The approach will be primarily philosophical but with attention to history and regulation. Many of the great cases (such as the Nazi Doctors' Trial, the Tuskegee syphilis study, Willowbrook, Milgram's authority experiments, and the recently revealed U.S. government-sponsored radiation studies) will be examined with an eye both to historical detail and to ethical analysis. The course will emphasize controversies concerning the ethical design of research studies (e.g., randomization, placebos, informed consent, coercive inducements, gauging risk and benefit, etc.) as well as problems posed by specific "subject populations" such as medical students, prisoners, developing-world subjects, and cognitively impaired patients. Throughout the course, we will have practical experiences in the ethical review of research protocols. *Prerequisites: None.* 3 credits
Course Master: Henry Silverman, MD, MA

PREV 638 Ethical Issues in International Research This course will examine the ethical and philosophical issues raised by research on human subjects, particularly as such research is conducted in an international setting. The course assumes that the student has had at least some elementary acquaintance with basic concepts in research ethics. (This acquaintance may consist of prior or concurrent study of research ethics or some experience in conducting or assessing human subject research. The student should contact the instructor if further clarification is needed.) *Prerequisites: None* 3 credits
Course Master: Henry Silverman, MD, MA

PREV 639 Institutional Review Boards The development of Institutional Review Boards (IRBs) has played an integral role in the protection of research subjects and has also served as an important regulatory mechanism in the review and conduct of research. This course will explore the history that

brought about the development of IRBs as well as the purpose, structure, and function of IRBs. Accordingly, the course will examine the necessary elements of standard operating procedures, including constitution of membership, elements of review, and issues involved with conflicts of interests. Other lectures will explore mechanisms of expedited and exempt reviews, elements of a waiver of consent, the continuing review process the dynamics of IRB decision making, and different models for the review of research, e.g., local versus centralized IRBs. The course will explore the relationship between members of the research team and the IRBs and explore Good Clinical Practice Guidelines. Practical exercises will include submission of an FWA, review of consent forms, and mock IRB exercises. Each class participant will obtain pre-meeting IRB materials and observe the conduct of four IRB meetings. *Prerequisites: None* 2 credits
Course Master: Henry Silverman, MD, MA

PREV 645/LAW 648B Critical Issues in Health Care This interdisciplinary course is open to students from the Schools of Law, Medicine, Social Work, Nursing, Pharmacy, Dentistry and the graduate schools at UMB and UMBC. The course is designed to: (1) provide students with an opportunity to reflect on the legal, ethical and policy issues surrounding a number of health care delivery problems; (2) expose participants to the basic skills necessary to analyze problems from a legal, ethical and policy perspective; and (3) offer participants from different disciplines an opportunity to interact and share information and perspectives about their professions with one another. A variety of teaching techniques, including case studies, simulations, and panel discussions will be used to explore such topics as medical malpractice, rights of patients to refuse treatment, informed consent and substituted consent in medical decision making, confidentiality v. duty to disclose medical information, regulation of experimental drugs, and health care reform. During the course, students will have an opportunity to work in multidisciplinary teams to analyze a particular health care problem and develop a position paper on a health care policy issue.
Prerequisites: none. 3 credits
Course Master: D. Hoffman, JD

PREV 648 Health Care Administration and Evaluation Lectures, seminars, readings, and small group discussions are designed to convey an understanding of health care systems, their structure, function, and effectiveness. Topics include: principles of management; municipal, state, national, and foreign organizational systems; HMOs; health care costs; cost containment and quality; regulations; planning and evaluation; health manpower, and applied problem solving. Available as a two-hour lecture course with an option to take an additional hour which provides in-depth exposure to a selected topic in health care administration and evaluation resulting in a paper. *Prerequisites: none.* 2 credits
Course Master: J. Cooksey, MD, MPH

PREV 649 Introduction to Preventive Medicine A seminar course which emphasizes the applications of epidemiology, statistical reasoning, and preventive medicine to clinical practice. The role of the physician and other health professionals in the primary and secondary prevention of disease is discussed. Topics include relationships among physicians, hospitals, nursing homes, regulatory agencies, third party payers and the law. **Required for Preventive Medicine residents only.** *Prerequisites: PREV 600 and PREV 620 and consent of instructor.* 2 credits
Course Master: J. Rubin, MD, MPH

PREV 650/PHSR670 Principles of Health Education and Health Promotion presents a scientific process designed to achieve voluntary behavioral change to improve health status. Health promotion utilizes health education to promote health and prevent disease. The analytical process used to explore health problems, the identification of factors associated with them, and the development and evaluation of interventions are covered. *Prerequisites: none.* 3 credits

Course Master: D. Fedder, DrPH

PREV 651 Molecular Biology in Public Health Research This course will review the basics of molecular biology as the basis for a discussion of molecular methods frequently utilized in population based health studies. The course is tailored towards students that are planning to take advanced epidemiology courses, such as Molecular Epidemiology, cancer Epidemiology and Epidemiology of Infectious Disease but that might be unfamiliar with recent developments in molecular biology. While introducing details of molecular techniques during the lectures students will only be expected to achieve competence in understanding the principles of molecular techniques as applicable to population-based research. Through discussions of relevant publications students will be enabled to better judge issues associated with utilizing molecular analysis methods in population studies.

Prerequisites: None. 1 credit

Course Master: Volker Mai, PhD, MPH

PREV 659 Observational Studies in Epidemiology This course provides an in-depth examination of study designs, including case-control and cohort studies. Special emphasis will be placed on possible biases that can occur in epidemiologic research. Some special topics will also be addressed in detail, including screening, misclassification, and questionnaire construction. ***For students with doctoral level degrees only.*** *Prerequisites: PREV 600. 3 credits*

Course Masters: L. Hungerford, PhD and A. Harris, MD, MPH

PREV 664 Critical Issues in Global Health A series of seminars, lectures and reading assignments designed to give students an overview of the global health problems facing the world today and equip them with tools to navigate the world of international health. The course focuses on teaching students about the global burden of disease and pattern of disease variations between and within countries. It addresses cross cutting issues such as poverty, environmental degradation and the impact of globalization on health. Topics include maternal and child health, gender and violence, nutrition, water and sanitation. *Prerequisites: none. 3 credits.*

Course Master: Hala Azzam, PhD, MPH and Jeffrey Johnson, PhD

PREV 668 Environmental and Occupational Health Course surveys the effects of the environment on human health. Topics include occupational exposures; toxicology of environmental pollutants; occupational epidemiology; industrial hygiene; legal and regulatory aspects; role of the physician and nurse in the workplace; control of exposures; and health education relating to the worker. Instruction by lectures, seminars, and field trips to sites of interest. *Prerequisites: none. 3 credits*

Course Master: S. Amr, MD, MS

PREV 681 Epidemiology of Aging involves students in learning how the principles and methods of epidemiology and preventive medicine can be applied to the study of aging. There is a review of health assessment techniques which are potentially useful for conducting epidemiological studies of older persons; the epidemiology of selected diseases common to old age; primary, secondary and tertiary prevention, as applied to older persons, focusing on psychosocial and environmental aspects of health; differing conceptions of long-term care, and its role in the prevention, intervention, and treatment of illness in older persons. Students learn how to critically evaluate and present research in a specific area of gerontological epidemiology with faculty supervision. *Prerequisites: PREV 600 or consent of instructor. 3 credits*

Course Master: J. Magaziner, PhD

PREV 700 Cardiovascular Disease: Epidemiology and Prevention is taught in a seminar format in which each student, with faculty guidance, chooses a current problem in cardiovascular epidemiology and, following a presentation of the problem, outlines an approach to the problem that is discussed in

class. After incorporating relevant feedback, the student gives a formal presentation and submits a term paper that represents a comprehensive review of the topic. *Prerequisites: PREV 600 and PREV 620 or consent of instructor.* 3 credits
Course Master: S. Havas, MD, MPH

PREV 701 Cancer Epidemiology is taught in a seminar format in which each student, with faculty guidance, chooses a current problem in cancer epidemiology and, following a presentation of the problem, outlines an approach to the problem that is discussed in class. After incorporating relevant feedback, the student gives a formal presentation and submits a term paper that represents a comprehensive review of the topic. *Prerequisites: PREV 600 or consent of instructor.* 3 credits
Course Masters: V. Mai, PhD, MPH and Hala Azzam, PhD, MPH

PREV 702 Advanced Quantitative Methods in Epidemiology Students will discuss each session one or two papers related to an advanced quantitative method in epidemiology. Discussion will be lead be either a student or faculty member. Students will write a 7-15 page paper on the topic that they lead. *Prerequisites: PREV 620 and PREV 720.* 2 credits
Course Master: L. Magder, PhD

PREV 703 Complex Disorders Seminar This seminar series includes speakers from both inside and outside the University of Maryland Baltimore. The individual speakers focus on topics including the difficulties of defining phenotypes, the problems involved in identifying genetic variation, and the statistical issues involved in correlating multiplicity of genotype data with that of phenotypic data. Speakers address these topics by discussing their research including luekodystrophies, bipolar disorder, prostate cancer, and eye diseases. Outside speaker seminars are followed by discussions led by Dr. Stine. 2 credits
Course Master: C. Stine, PhD

PREV 704 Molecular Epi Practicum (Lab Rotation) The course involves three, three-month assignments across the nine month school year and should be taken after completion of the first year of coursework. *Prerequisites: Completion of first year courses.* 3 credits
Course Master: C. Stine, PhD

PREV 705/PPAS 704 Pharmacoepidemiology An introduction to the field of pharmacoepidemiology using quantitative research methods to examine the benefits or risks of marketed medications. The course is intended to offer techniques to medical and health researchers who wish to assess the utilization, effectiveness and safety of marketed drug therapies. *Prerequisites: none.* 3 credits
Course Master: J. Zito, PhD

PREV 706 Research Informatics: Data Management in Research Clinical research frequently requires the efficient collection, storage and manipulation of data sets of varying sizes. Researchers must be adept at selecting and using appropriate computer-based tools to aid in this process. Further, researchers must be able to make use of and manage computer programmers and technical support staff hired to support research projects. *Prerequisites: PREV 600, PREV 620 previously or concurrently or with permission of the course master.* 2 credits
Course Master: K. Tracy, PhD

PREV 707 Cost-Effectiveness in Prevention and Treatment A 3-semester hour graduate course for Masters and Doctoral students in the Health Sciences. This course is a component in the core methods for public health sciences, especially focusing on the preventive measures in healthcare. Cost-effectiveness analysis is an integral part of the design and development of interventions, so that optimal decisions can be made in selecting the alternative to be implemented. Additionally, the

evaluation of outcomes should include an empirical cost-effectiveness analysis to improve the body of knowledge available to future work. These techniques are also applied in randomized clinical trials. This course examines principles and techniques of Cost-Effectiveness Analysis (CEA) in healthcare from a prevention perspective. Participants learn key elements of the economist's analysis of costs, and effect, in order to achieve a comparative and incremental cost-effectiveness analysis. Student projects design and conduct a hypothetical and empirical CEA. *Prerequisites: PREV 600, PREV 720 or the equivalent.* 3 credits

Course Master: D. Bradham, DrPH

PREV 711 Genetic Epidemiology will provide the student with an overview of basic methods in genetic epidemiology, with application to common complex diseases such as coronary heart disease, type 2 diabetes and obesity. The course will begin with a review of basic human genetics and then proceed to a description of methods used to dissect the genetic contribution to human disease and to map genes. Topics include: assessment of familial aggregation, heritability analysis, segregation and linkage analysis, genetic association studies, and linkage disequilibrium mapping. The course will involve a computer lab and students are expected to complete a data analysis project using genetic analysis software and to write up their results as a course project. *Prerequisites: PREV 600, PREV 619, PREV 620 or their equivalents, or consent of instructor. Background in basic human genetics helpful.* 3 credits

Course Master: B. Mitchell, PhD, MPH

PREV 715 Injury Epidemiology and Prevention helps students understand basic models of injury causation, principles of injury prevention and control, how to design epidemiologic studies of risk factors for injury and how to evaluate public health interventions designed to address the problem of injuries. 2 credits *Prerequisites: PREV600*

Course Master: Elisa Braver, PhD

PREV 720 Statistical Methods in Epidemiology provides instruction on the specific statistical techniques used in the analysis of epidemiological data. Topics include: treatment of stratified and matched data, detection of interaction, conditional and unconditional logistic regression, survival analysis, and proportional hazards models. *Prerequisites: PREV 600, PREV 620 and consent of instructor.* 4 credits

Course Master: L. Magder, PhD

PREV 721 Regression Analysis Covers basic principles and theory of regression techniques. Topics include simple and multiple linear regression, robust regression, regression diagnostics, logistic and poisson regression analysis. The emphasis of this course is on learning the biomedical research application and interpretation of regression techniques. *Prerequisites: PREV 620 or consent of instructor.* 2 credits

Course Master: Hegang Chen, PhD

PREV 722/PHSR 722 Advanced Topics in Product Safety and FDA Regulation The purpose of this course is to engage students in the techniques of pharmacoepidemiology through case studies and by working through an actual drug safety investigation. Drug safety will be addressed in the context of science and the law through readings, debates, and discussions with invited guests from the FDA, a pharmaceutical company/consulting agency, and a law firm. Students will work together as an investigative team under the direction of the instructor. Using the Food and Drug Administration's Adverse Event Reporting System database and the medical literature, students will work up the epidemiological characteristics of a drug safety signal. Based on the characteristics of the signal, the team will design a pharmacoepidemiological study to further evaluate the safety signal. *Prerequisites: PREV 600, PREV 620, PREV 705/PHSR 704, or permission of the instructor.* 2-3 credits.

Course Master: S. Weiss, PhD

PREV 723 Survival Analysis Examines methods of analysis for time to event data, including non-parametric methods, Kaplan-Meier analysis, log-rank and Wilcoxon tests, Cox proportional hazards models, time-dependent covariates, discrete time models; parametric methods. *PREV 620 or consent of instructor* 2 credits

Course Master: Patricia Langenberg, PhD

PREV 747 and PREV 748 Epidemiology and Preventive Medicine Research Practicum I & II provide guided experience in epidemiologic research over two semesters. Students are expected to complete a data-based project that includes analysis of data and preparation of manuscript to report findings. *Prerequisites: PREV 619, PREV 720 (or concurrent enrollment) and PREV 600 previously.* 5 credits

Course Masters: M. Roghmann, MD, MS and Faculty

PREV 749 Infectious Disease Epidemiology consists of lectures, seminars and reading assignments designed to promote an understanding of infectious disease epidemiology, with particular emphasis on modes of transmission--contact, contaminated vehicles, vector-associated and airborne; interventions and approaches to disease control--smallpox, measles, typhoid, influenza, hospital infections; infections of public health importance in Maryland and use of the laboratory in infectious disease epidemiology. *Prerequisites: A basic knowledge of medical microbiology.* 3 credits

Course Master: T. Strickland, MD, PhD

PREV 750 Epidemiology, Ecology and Control of Parasitic Disease Through a series of lectures, case discussions and presentations by students, this course covers public health aspects of major parasitic diseases in the developing world. Emphasis is on the factors that determine the distribution of protozoan and helminthic diseases within human populations and the conceptual basis for current control programs. For each pathogen, the prospects for elimination, eradication or successful control at a global level are examined. Principles covered in this course can be applied to the study of other infectious diseases. *Prerequisites: Previous course in biology and completion or concurrent enrollment in a basic epidemiology course required; knowledge of microbiology or infectious diseases desirable.* 2 credits

Course Master: James H. Maguire, MD, MPH

PREV 758 Health Survey Research Methods leads students through the steps in survey research from developing a survey questionnaire, to administering it and analyzing the data. The final results of the survey are presented in a paper. *Prerequisites: PREV 620 or consent of instructor.* 3 credits

Course Master: O. Carter-Pokras, PhD

PREV 769 Neuroepidemiology is a seminar course which covers the epidemiology of the major classes of neurologic diseases including cerebral vascular, Alzheimer's, Parkinson, multiple sclerosis, epilepsy and peripheral neuropathy. Methodologic issues are emphasized, such as gradual onset, lack of definitive tests, and use of surrogate responders. There are student presentations and a written assignment. *Prerequisites: PREV 600 or consent of instructor.* 3 credits

Inactive Course

PREV 778 Musculoskeletal Epidemiology presents the epidemiology of the major musculoskeletal diseases of childhood and the adult years. It emphasizes the interrelationships of the biological with the epidemiologic aspects. Prevention of disease through risk factor modification is stressed wherever possible. Methods of classification and diagnosis, and potential problems introduced by different schemes are presented. Disorders covered are rheumatoid arthritis (both juvenile and adult-

onset), osteoarthritis, osteoporosis, Legg-Perthes disease, osteogenesis imperfecta, systemic lupus erythematosus, scleroderma, and the spondyloarthropathies. *Prerequisites: PREV 600 or equivalent with consent of instructor.* 2-3 credits
Inactive Course

PREV 780 Molecular Epidemiology covers the theoretical framework of the discipline of molecular epidemiology but focuses on the practical application of a basic knowledge of the field which will enable students to critically read the literature and to incorporate the techniques into epidemiological research. Students should have at least a limited background in biological sciences, although those with more advanced training will find the course of interest. *Prerequisites: none.* 3 credits
Course Master: J. Flaws, PhD

PREV 789 Special Studies and Research (1-6) This individually-planned and closely-supervised course provides experience in Public Health topics. *Prerequisites: PREV 600 and 620 or equivalent.* 1-6 credits.
Various Faculty

PREV 801 Longitudinal Data Analysis Analysis of Longitudinal and Clustered Data includes topics in matrix algebra, longitudinal data analysis including the multivariate linear model, marginal and mixed effects general linear models, residual analysis and diagnostics, generalized linear models, including marginal (GEE methods) and mixed effects models for repeated measures and other clustered data. *Prerequisites: PREV 620 and PREV 721(721 may be taken concurrently).* 2 credits.
Course Master: Patricia Langenberg, PhD

PREV 802 Statistics for Molecular Biology Three topics are covered in this course: statistical design and analysis of experiments; DNA or protein sequence alignment; and analysis of gene expression data from microarray experiments. *Prerequisites: PREV 720 and 721 or permission of instructor.* 2 credits.
Course Master: Hegang Chen, PhD

PREV 803 Clinical Trials and Experimental Epidemiology presents a rigorous overview of the experimental method as applied in therapeutic evaluations, and demonstrates causal associations between risk factors and clinical outcomes. The history of the experimental method and its clinical applications are studied in detail. Guest speakers of unique expertise and experience in clinical trials also are drawn upon. *Prerequisites PREV 600 or equivalent and at least one semester of biostatistics.* 3 credits
Course Master: R. Scherer, PhD

PREV 808 Substantive Topics in Epidemiology is an individual program of study undertaken with faculty supervision in one or more substantive areas of epidemiology. Through assigned reading and critical discussion, the student becomes knowledgeable in a specialized area of epidemiology, with particular emphasis on recent advances. Preparation of a critical review of the literature suitable for publication is required. *Prerequisites: Instructor consent.* 3 credits
Various Faculty

MPH Core Courses

PH 600 Principles of Epidemiology presents a comprehensive treatment of the concepts and methods of chronic disease epidemiology. Topics include the classification of statistical associations and methods of distinguishing between causal and non-causal associations. Case-control, cohort and experimental studies are considered in detail. There are also presentations by students of epidemiological papers, including those linking lung cancer to cigarette smoking. *Prerequisites: PREV 620 previously or concurrently and consent of instructor.* 3 credits
Course Masters: M. Baumgarten, PhD / Sandra Black, PhD

PH 610 Foundations of Public Health This course will examine the complex set of factors that are associated with the health and disease of diverse populations, including the individual, organizational, community and population. Course content will highlight the social and behavioral sciences, communication and informatics sciences and public health law and ethics. We will go beyond the individual risk factor approach to health and disease, applying multi-disciplinary models which elucidate the economic, sociocultural, political, and behavioral context and processes underlying health care access and decision-making. *Prerequisites: none.* 4 credits
Co-course masters: Glenn Morris, MD, MPH&TM and Renee Royak-Schaler, PhD, MEd

PH 620 Principles of Biostatistics is designed to develop an understanding of statistical principles and methods as applied to human health and disease. Topics include: research design; descriptive statistics; probability; distribution models; binomial, Poisson, and normal distribution; sampling theory and statistical inference. *Prerequisites: Knowledge of college algebra required. Calculus recommended.* 3 credits
Course Masters: C. Brown, PhD and L. Magder, PhD

PH 621 Biostatistical Methods This course is designed to introduce the students to a broad range of methods commonly used in biomedical and public health research, and to provide some hands-on data analysis experience. Topics to be covered include the role of statistics in science, properties of distributions, exploratory data analysis, inference about means, proportions and survival distributions, and introduction to multivariable methods. **This course does not meet the degree requirements for the MS or PhD in Epidemiology and Preventive Medicine nor does it meet the degree requirements for the MPH concentration in Epidemiology and Preventive Medicine.**
Prerequisites: Knowledge of college algebra. 3 credits
Course Master: L. Magder, PhD

PH 648 Health Care Administration and Evaluation Lectures, seminars, readings, and small group discussions are designed to convey an understanding of health care systems, their structure, function, and effectiveness. Topics include: principles of management; municipal, state, national, and foreign organizational systems; HMOs; health care costs; cost containment and quality; regulations; planning and evaluation; health manpower, and applied problem solving. Available as a two-hour lecture course with an option to take an additional hour which provides in-depth exposure to a selected topic in health care administration and evaluation resulting in a paper. *Prerequisites: none.* 2 credits.
Course Master: J. Cooksey, MD, MPH

PH 668 Environmental and Occupational Health Course surveys the effects of the environment on human health. Topics include occupational exposures; toxicology of environmental pollutants; occupational epidemiology; industrial hygiene; legal and regulatory aspects; role of the physician and nurse in the workplace; control of exposures; and health education relating to the worker. Instruction

by lectures, seminars, and field trips to sites of interest. *Prerequisites: none.* 3 credits
Course Master: S. Amr, MD, MS

PH 789 Capstone Experience is a supervised public health field experience that requires substantive application of the knowledge and skills acquired in the MPH core courses and in courses taken in the area of concentration. The Capstone proposal is developed by the student in consultation with the faculty advisor, and must be approved by the director of the student's MPH concentration area and the Capstone Committee. The field experience will be jointly supervised by the faculty advisor and a field preceptor. Examples of possible field experiences include significant contributions to a research study, placement in a government health department with an assigned project, systematic review of literature culminating in paper submitted for publication, development of public health policy for a government or non-profit agency. *Prerequisites: completion of all core courses and at least 20 credit hours.* Time requirement: at least 240 contact hours in six week block or extended over a longer period. . *Prerequisites: students must have completed all MPH core and concentration courses.* 6 credits

Course Master: Sania Amr, MD, MS

PH TBA Special Topics in Public Health (1-6) This individually-planned and closely-supervised course provides experience in public health topics. *Prerequisites: PH600, 610 and 620.* 1-6 credits.
Various Faculty