



PubH 6381

Genetics in Public Health

Fall Term 2016

Credits:	2
Meeting Days:	Wednesday 9/7/2016 – 12/14/2016
Meeting Time:	11:15 am - 1:10 pm
Meeting Place:	Mayo Building, Room 1250 (12 th floor)
Instructor:	Ellen W. Demerath, PhD
Office Address:	West Bank Office Building, Room 455
Office Phone:	612-624-8231
Fax:	612-626-0315
E-mail:	ewd@umn.edu
Office Hours:	By appointment

I. Course Description

Our understanding of human genomic variation and its relationship to health are expanding rapidly. This course will provide an introduction to the field of public health genomics, which integrates findings from genetic epidemiology (the search for genetic risk factors for disease) into public health services and policies to prevent disease and improve health at the population level. Approximately two-thirds of the course will be devoted to Genetic Epidemiology. Topics will include different approaches to measuring the association of genes with disease: family history, heritability, and genetic association, how to model gene-by-environment interactions, epigenetics, and Mendelian Randomization as an approach to causal inference. The last third of the course will cover public health applications of genomics, including criteria for population-based genetic testing, informed consent and incidental findings in genetics research, personalized medicine, and direct to consumer marketing of genetic tests.

II. Course Prerequisites

This is a graduate course designed primarily for MPH and PhD Epidemiology students, although students in CEHD, Dentistry, Medicine and other schools have had good success in this course as well. It is preferable that Epidemiology students have completed Epi I or equivalent. Graduate students in other School of Public Health Divisions, and students pursuing graduate degrees in the biological or academic health center sciences are also welcome. Completion of a course in genetics at the undergraduate or graduate level is required. Please contact the instructor if you have questions on prerequisites or would like to ask for special permission.

III. Course Goals and Objectives

At the end of this course, you will:

- Properly use genomic terminology
- Find internet-based resources for current public health genomics information.
- Critically read and summarize current genetic epidemiological literature.
- Identify gaps in the public health genomics literature
- Work with colleagues to debate ethical, legal, social, and political implications of genetic testing in research and in the community.
- Communicate public health genomic information in oral and written form

IV. Methods of Instruction and Work Expectations

Each 2 hour class meeting will include an instructor-led lecture, with activities for student learning and class discussion.

Graduate work requires at least 2 hours OUTSIDE of class for each credit hour in class; therefore, given you are spending 4 hours in class per week, you should expect to spend up to 8 hours per week outside of class reading and preparing for class, researching your final project and preparing your poster for presentation.

V. Course Text and Readings

All Required and Supplemental Readings are available on the Moodle Class site at least one week prior to the class meeting for which it is assigned.

VI. Course Outline/Weekly Schedule

Date/Week	Lecture Title	Instructor	Quizzes	Readings
Week 1: 9/7	Introduction to Public Health Genomics and Genetic Variation	Demerath		Text Ch.1 Duquette et al., 2012 Burke et al., 2010
Week 2: 9/14	Genetic Epidemiology: Family History and Heritability	Demerath	Quiz 1 completed 9/16	Text Ch. 2 Walter et al., 2015 Min et al., 2013
Week 3: 9/21	Genetic Epidemiology: Genetic Association	Demerath		Text Ch. 8 Benn et al., 2010 Quanto power doc.
Week 4: 9/28	Genetic Epidemiology: Genome-wide Association	Demerath	Quiz 2 completed 9/30	Text Ch. 7 Manolio, 2010 Demerath et al. 2013 Lunetta et al., 2015
Week 5: 10/5	Genetic Epidemiology: Cardiovascular Disease	Tang		O'Donnell 2011 Swerdlow et al 2012 Tang et al 2013
Week 6: 10/12	Genetic Epidemiology: Epigenetics	Demerath	Quiz 3 completed 10/14	Text Ch 14 Relton 2010 Mill & Heijmans 2013
Week 7: 10/19	Genetic Epidemiology: Cancer	Poynter		Hsu et al. 2015 Roychowdhury et al 2011 Muehlenbachs et al 2015

Week 8: 10/26	Genetic Epidemiology: Obesity	Demerath	Quiz 4 completed 10/28	Loos and Yeo, 2014 Qi et al., 2012 Demerath et al. 2015
Week 9: 11/2	Translation: Cascade Screening for Familial Hypercholesterolemia	Zierhut		Foody, 2014 Santos et al., 2015
Week 10: 11/9	Translation: Precision Medicine and Health Disparities (Debate)	Students		
Week 11: 11/16	Genetic Epidemiology: Mendelian Randomization, and ACCE Framework for Assessing Genetic Tests for the Population	Demerath	Quiz 5 completed 11/18	Lawlor et al., 2008 Yaghuotkar et al., 2013 Khoury Ch. 11
Week 12: 11/23	Translation: Assessing Genetic Test and Genetic Information	Demerath		Khoury Ch. 12 Besser et al 2015 Mihaescu et al 2011
Week 13: 11/30	Translation: Newborn Genomic Screening Tests	Oehlke	Quiz 6 completed 12/2	A spot of trouble... Bearder Decision MN AAP 2014 NBS Statute 144
Week 14: 12/7	Familial Hypercholesterolemia Project, In-Class Group Work	Students		N/A
Week 15: 12/14	Familial Hypercholesterolemia Project, Oral Presentations	Students		N/A

Course Assessments

Online Quizzes (6)	60% of grade
Group Debate	20% of grade
Group Project	20% of grade

Assessment 1: Quizzes (60%)

There will be 6 quizzes; these will be open-book, completed on-line on the Moodle site. The quiz may include terminology, problem solving, or a short-response.

Assessment 2: In-Class Debate (20%)

Students will be assigned to one of two debate teams (Pro and Con) for the topic: *"Precision Medicine will reduce health disparities"*. As a group, you will assign tasks to each group member related to searching the literature, documenting evidence, writing the opening argument, and writing the rebuttal. A limited search of the recent literature on PubMed, as well as internet-based research and blogs will provide you with plenty of interesting and helpful ideas and information to support and defend your arguments!

Assessment 3: Group Project on Familial Hypercholesterolemia (20%)

Details on the Group Presentation requirements, format, and grading rubric will be made available in late October/Early November.

Course Evaluation

The SPH will collect student course evaluations electronically using a software system called CourseEval: www.sph.umn.edu/courseval. The system will send email notifications to students when they can access and complete their course evaluations. Students who complete their course evaluations promptly will be able to access their final grades just as soon as the faculty member renders the grade in SPHGrades: www.sph.umn.edu/grades. All students will have access to their final grades through OneStop two weeks

after the last day of the semester regardless of whether they completed their course evaluation or not. Student feedback on course content and faculty teaching skills are an important means for improving our work. Please take the time to complete a course evaluation for each of the courses for which you are registered.

Incomplete Contracts

A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last official day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college). For more information and to initiate an incomplete contract, students should go to SPHGrades at: www.sph.umn.edu/grades.

University of Minnesota Uniform Grading and Transcript Policy

A link to the policy can be found at onestop.umn.edu.

VII. Other Course Information and Policies

Grade Option Change (if applicable):

For full-semester courses, students may change their grade option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester courses) can be found at onestop.umn.edu.

Course Withdrawal:

Students should refer to the Refund and Drop/Add Deadlines for the particular term at onestop.umn.edu for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Office of Admissions and Student Resources at sph-ssc@umn.edu for further information.

Student Conduct Code:

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see: http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf.

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

Use of Personal Electronic Devices in the Classroom:

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be

used in the classroom. For complete information, please reference:
<http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Scholastic Dishonesty:

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code: http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see:
<http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html>.

The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: <http://www1.umn.edu/oscai/integrity/student/index.html>. If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

Makeup Work for Legitimate Absences:

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see:
<http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html>.

Appropriate Student Use of Class Notes and Course Materials:

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see:
<http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Sexual Harassment:

"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy:
<http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf>

Equity, Diversity, Equal Opportunity, and Affirmative Action:

The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy:
http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf.

Disability Accommodations:

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center Student Services is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DRC at 612-626-1333 or drc@umn.edu to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.

For more information, please see the DS website, <https://diversity.umn.edu/disability/>.

Mental Health and Stress Management:

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: <http://www.mentalhealth.umn.edu>.

The Office of Student Affairs at the University of Minnesota:

The Office for Student Affairs provides services, programs, and facilities that advance student success, inspire students to make life-long positive contributions to society, promote an inclusive environment, and enrich the University of Minnesota community.

Units within the Office for Student Affairs include, the Aurora Center for Advocacy & Education, Boynton Health Service, Central Career Initiatives (CCE, CDes, CFANS), Leadership Education and Development –Undergraduate Programs (LEAD-UP), the Office for Fraternity and Sorority Life, the Office for Student Conduct and Academic Integrity, the Office for Student Engagement, the Parent Program, Recreational Sports, Student and Community Relations, the Student Conflict Resolution Center, the Student Parent HELP Center, Student Unions & Activities, University Counseling & Consulting Services, and University Student Legal Service.

For more information, please see the Office of Student Affairs at <http://www.osa.umn.edu/index.html>.

Academic Freedom and Responsibility: *for courses that do not involve students in research:*

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, (Dr Kristin Anderson, SPH Dean of Student Affairs), or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.

** Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".*

Student Academic Success Services (SASS): <http://www.sass.umn.edu>:

Students who wish to improve their academic performance may find assistance from Student Academic Support Services. While tutoring and advising are not offered, SASS provides resources such as individual consultations, workshops, and self-help materials.

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