PHG 301
PUBLIC HEALTH GENOMICS: INTRODUCTION TO GENETIC EPIDEMIOLOGY
3 Credits
Winter, 2013
Mondays & Wednesdays, 3:30-4:50
Location TBD

Instructors
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Course Overview and Curriculum Content

This course offered by the Institute for Public Health Genetics will survey a wide range of approaches for investigating the genetic and environmental causes of disease, and provide examples of how genetic epidemiologic research findings can be used in public health and clinical practice to improve the health of individuals and populations. We will also touch on the ethical, societal, political and legal dimensions that can arise when using information on genetic and environmental factors in research and practice. This course will develop students’ ability to understand the basic approaches used to identify genetic and environmental factors in health and disease, and how the application of this information can be used improve population health, as well as to appreciate the ethical, legal and social implications that can arise in both research and translation to practice.

Course Learning Goals/Objectives

By the end of the course each student will be able to:
- Define genetic epidemiology
- Describe the fundamental concepts critical to genetic epidemiology
- Describe the major study designs used in genetic epidemiology
- Be able to collect family health information and draw a pedigree using a software program
- Describe the relationship and impacts of genetic epidemiology on public health
- Describe the benefits and harms of direct to consumer genetic testing
- Explain how genetic epidemiologic findings can be applied in public health using current examples
- Critically analyze media presentations that present genetic science and its applications

Course Evaluation and Grading Expectations

The course grade will be based upon a midterm, final examination, and a weekly set of responses to discussion questions based on the readings. The midterm will account for 25% of your grade, the final exam for 40%, and the discussion question responses, 30%. The midterm and the final exam will be a
combination of complex multiple choice and true/false questions. Both exams will be administered using the Catalyst web-based testing system.

All exams and assignments are subject to the University of Washington’s Student Conduct Code including sanctions and disciplinary actions [http://www.washington.edu/students/handbook/conduct.html] Grading will conform to the University of Washington’s Standard Grading Policy as detailed at http://www.washington.edu/students/gencat/front/Grading_Sys.html#GRADE

Disability-related Needs

To request academic accommodations due to a disability, please contact Disability Resources for Students (DRS), 448 Schmitz, (206) 543-8924 (V), (206) 543-8925 (TTY). If you have a letter from DRS, please present the letter to me so we can discuss the accommodations you might need in this class.

Course Readings and Schedule

The following section outlines the reading assignments and sets forth a preliminary timetable. It is possible, if not likely, that the timetable and reading assignments will be amended during the course, depending on our pace and new developments. Please note that reading assignments should be completed prior to our coverage of that portion of the outline in class.

January 7, 2013: Introduction to Course and to Faculty

Investigating disease in populations: What is genetics? What is epidemiology? And what do they mean together?

- Review the Talking Glossary of Genetic Terms (http://www.genome.gov/Glossary/) and the Excite Glossary of Epidemiology Terms (http://www.cdc.gov/excite/library/glossary.htm) to use as reference throughout the course.

Module 1: Family Health History

January 9, 2013

Family Data: Will we become our parents?

- Progeny Software www.progenysoftware.com/

January 14, 2013:

Movie and Discussion Session


January 16, 2013:

Family Health History as a Public Health Tool

January 23, 2013:
Studying genetic causes of disease in families.

January 28, 2013:
Social vs. biologic definitions of family and implications for public health
- McGrath BB & Edwards KL. When family means more (or less) than genetics. The intersection of culture, family and genomics. J Transcultural Nurs. 2009;3:270-77

Module 2: Genes in Populations
January 30, 2013
Equilibrium and Disequilibrium: Looking at genetic variation in populations

February 4, 2013
Ancestry Testing: Looking Back and Moving Forward

February 6, 2013:
Movie and Discussion Session

Midterm Exam

Module 3: Genetic Epi Study Design and Screening
February 11, 2013
What can we learn from unrelated people about genetic risk? Overview of case-control studies and measures of association

February 13, 2013
Genes and Disease in Individuals and in the Population
- Review the following articles from the Nature Education Scitable website on Genes and Disease (http://www.nature.com/scitable/topic/topic/genes-and-disease-17) :
February 20, 2013
Screening and Utility of Genomic Information
- Institute of Medicine, Report on Genomics in Public Health, pp. 32-54

February 25, 2013
- Review websites for the HapMap project and the 1000 genomes project

Module 4: Epigenetics, Gene Expression and Gene-Environment Interactions
February 27 2012
Movie and Discussion Session
- Ghosts in Your Genes (PBS) http://www.pbs.org/wgbh/nova/genes/

March 4, 2013
Epigenetics

March 6, 2013
Gene Expression
- http://genome.wellcome.ac.uk/doc_WTD020757.html

March 11 2013
Nature vs. Nurture – is it still a relevant question? Examples of Gene-Environment Interactions
March 13 2013
Are you what you eat? Genetics of taste and Nutrigenomics
• Nutrigenetic Testing: Tests Purchased from Four Web Sites Mislead Consumers. 2006 Report from the GAO. http://aging.senate.gov/events/hr162gk.pdf
• Nutrigenetics Testing: Tests Purchased from Four Web Sites Mislead Consumers. 2006 Report from the GAO. http://aging.senate.gov/events/hr162gk.pdf
• http://learn.genetics.utah.edu/content/begin/traits/ptc/

- Final Exam