

**EPIDEMIOLOGY 743 • GENETIC EPIDEMIOLOGY • SPRING
2016
SYLLABUS**

Course Information

Lead Instructor: Kari North

Office: Suite 306, Bank of America Building

Lecture: 2:00 – 3:15 T, Th, McGavran Greenberg 1305

Office Hours: By appointment

Phone: 966-2148

Required Texts:

1. **Genetic Epidemiology: Methods and Applications.** Melissa A. Austin (Author)
August 2013: ISBN-10: 1780641818 [Paperback, Kindle] (Available in UNC Bookstores and on www.amazon.com).
2. **Additional Readings:** Readings will be made available the week before each lecture is delivered, <https://sakai.unc.edu/portal>

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Purpose: The purpose of this course is to examine the concepts and methods of genetic epidemiology relevant to the study of complex human diseases.

Course Description: Genetic Epidemiology is a field of study that deals with the genetic etiology and distribution of diseases in populations. This course will provide students with a focused exposure to genetic analysis, with a major emphasis on association analysis. 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. Students will be exposed to the tools needed to critically review the literature in genetic epidemiology and human genetics.

Course Learning Objectives: At the end of this course, the student will be able to:

- Critically evaluate and summarize the genetic epidemiological literature
- Properly use genomic terminology
- Use internet-based resources for genetic epidemiologic and public health genomic information
- Identify limitations and omissions in the literature and design a study to fill those gaps

- Communicate public health genomic information by creating and presenting a scientific poster

Course Co-Requisites: Enrollment is open to all Epidemiology, Nutrition, and Biostatistics graduate students that have taken EPI 715 and BIOS 545. For all other cases, permission of the instructor is required.

Requirements: Grades will be based on the following:

<u>Event</u>	<u>Value</u>	<u>Due Date</u>
Project Topic: Significance and Innovation	50 points	2/4
Project Background	50 points	2/25
Project Approach	50 points	3/31
Final Project (poster/oral presentation)	50 points	4/21, 4/26
Exam Questions	200 points	1/28, 2/18, 3/10, 4/12

Total Points	400 points	

Grading: Letter grades are assigned according to the following scale: H (90 – 100%), P (60 – 89%), and L (50 – 60%), calculated from the requirements listed above.

Honor system: The Honor and Campus Codes embody the ideals of academic honesty, integrity and responsible citizenship and have governed the performance of all academic work and student conduct at the University for the past 100 years. Enrollment at this University presupposes a commitment to the principles embodied in these codes and a respect for this tradition.

Note: No make-up examinations will be given unless the instructor is notified before the exam is given.

Exam Questions: All exams will be short-answer and long-answer essay questions. Questions will be taken from the lectures and readings. There will be 4 exams that are due on 01/28, 02/18, 03/10, and 04/12. Assignments will consist of identification, short-answer essay, and long-answer essay questions. Each exam is worth 50 points.

Course Project: The final project is a poster presentation in which your peers and other scientists will be informed about your proposed research project. You are to design a study to identify new genomic determinants of a disease of public health importance, perhaps in a particular population, or in a particular context/environment, etc. This can include sequence variants, linkage analysis, GWAS, epigenetics, gene x environment or gene x drug interaction, or others. All students will submit their final project (Powerpoint file) via Sakai on April 21st. Powerpoint templates will be made available to you mid Semester. The structure of the poster should include:

a. Title and Author Banner

b. Background (what is the existing literature on this topic? What is the public health relevance?)

c. Research Question/Study

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d. Proposed Study Approach (Study design, population, measurements, analysis approach including sample size)

e. Expected Results and Public Health Impact

Oral Presentation of Poster: Students will present their proposed research study as a scientific poster in one of the last two class meetings (April 21 or April 26). This will be in the style of a moderated poster session; the presenter will give a 10-15 minute summary of the information. A short question and answer period will follow from the audience. The purpose of this assignment is to give you experience presenting your research to colleagues in a format that you will experience at scientific meetings.