

PSYC 5112
STATISTICAL GENETICS FOR COMPLEX TRAITS
Fall 2008 – Course Syllabus

Instructor

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Classes

Wednesday 9.30am-12.00pm

Location

IBG 210 (Seminar Room)

Description

The focus of this course will be on the methods for mapping complex disease genes in both population-based and family-based samples. Topics will include both linkage and association analyses of qualitative and quantitative phenotypes, with an emphasis on their application to empirical data using available computer software. Students will be exposed to the latest statistical methodology and computational resources for mapping genes underlying complex traits. They will also read and evaluate current statistical human genetics literature.

Required Reading

Pertinent journal articles will be distributed in class.

Recommended Texts (*none required*)

Texts typically vary in focus and perspective – given the rapid advances in technology and methodology, many texts become outdated very quickly. Listed below are a few recommended texts and what may be considered their focus:

Statistics in Human Genetics – P Sham

Good general overview, easy to follow

Statistical Methods in Genetic Epidemiology – DC Thomas

More recent text, provides big picture concepts, easy to read

Mathematical and Statistical Methods for Genetic Analysis – K Lange

Heavy on the statistics, good reference for the math underlying methods

Gene-Mapping in Complex Human Diseases – JL Haines and MA Pericak-Vance

Good general overview, emphasizes linkage

Fundamentals of Genetic Epidemiology – Khoury, Beaty and Cohen

Classic text, a bit outdated, good reference for segregation and linkage analysis

Genetics of Populations – PW Hedrick

Population genetics text only, no methods for gene mapping

Evaluation

In addition to the (approximately) weekly problem sets, a final linkage and association project will be presented at the end of the semester. Details of the project will emerge as the course progresses. Grades will be based on 50% problem sets and 50% final project.

Tentative Course Schedule

Class	Topic
08-27	Course Logistics / Introduction
09-03	Population Genetics
09-10	Linkage Analysis – Parametric
09-17	Linkage Analysis – Nonparametric
09-24	Linkage Analysis – Quantitative Traits
10-01	Linkage Analysis – SNPs and Future Prospects
10-08	Association Analysis – Conceptual Overview
10-15	Association Analysis – Population Based I
10-22	Association Analysis – Population Based II
10-29	Association Analysis – Family Based I
11-05	Association Analysis – Family Based II
11-12	Association Analysis – Large Scale I
11-19	Association Analysis – Large Scale II
11-26	<i>No Class - Thanksgiving Break</i>
12-03	<i>No Class – Work on Final Projects</i>
12-10	Final Project Presentations

The Fine Print

Disability Statement

If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and <http://www.Colorado.EDU/disabilityservices>.

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Classroom Behavior

Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See policies at <http://www.colorado.edu/policies/classbehavior.html> and at http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code.

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