Statistics 8625 (Autumn 2017)
Statistical Methods for Analyzing Genetic Data

Instructor	Prof. Shili Lin, 440A Cockins Hall, 2-7404, shili@stat.osu.edu
Lectures	MWF 10:20 AM - 11:15 AM; Caldwell Lab 183. No classes on September 4, October 13, November 10, 22, and 24
Office Hours	Monday 11:20 AM - 12:20 PM, Wednesday 9:00 AM - 10:00 AM, or by appointment
Grader	Mr. Xiaofei Zhou, zhou.1150@osu.edu
Website	http://carmen.osu.edu
Course Requirements	You are responsible for: material covered in class, assigned readings, homework assignments, and project. Class attendance is required.
Topics	Overview and history - statistical genetics, omics and bioinformatics Basic principles of population genetics Gene/haplotype frequency estimation Likelihood computation on pedigrees (exact and Monte Carlo methods) Association study; population and family based More advance topics (e.g. imprinting and maternal effects; rare variants) Topics in Bioinformatics (e.g. microarray/sequencing, methylation, Chromatin structures (spatial ineractions), data integration)
Homework	There are a total of 4-5 assignments. They are based on the materials covered in the lecture. No late homework will be accepted.
Assessments	There will be quizzes and a midterm; dates TBA.
Project	The project is to read, summarize, and present a journal article. Novel ideas on extending statistical methodologies or improving computational algorithms will be awarded extra points. It is being structured into three parts: Part I: summary of paper; Part II: slide preparation; Part III: Presentation. **A more research oritented project is also possible.**

Grades The final numerical grade will be determined as follows:

Homework assignments	10%
Quizzes and Midterm exam	40%
Reading and participation in discussion	10%
Project (including summary, slides, and presentation)	40%

References

Research Papers
Lange K (2003) *Mathematical and statistical methods for genetic analysis*, 2^{nd} Ed
Lin S & Zhao H (2010) *Handbook on analyzing human genetic data*
Ott J (1999) *Analysis of human genetics linkage*
Thompson EA (2000) *Statistical inference from genetic data on pedigrees*
Weir BS (2007) *Genetic Data Analysis 3*
Balding D, Bishop M, Cannings C (2007) *Handbook of Statistical Genetics*, 3rd Edition.

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/csc/.

Disability Services

Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue telephone 614- 292-3307, slds@osu.edu; slds.osu.edu.