

Syllabus for STA480/STA2080
Fundamentals of Statistical Genetics
Lei Sun

1. Contents

- We start with an overview of genetic studies to have a general understanding of its goal and study design.
- We then introduce the basic genetic terminologies necessary for the discussion of the various statistical methods used to understand human genetics
- The other specific topics include basic concepts of population genetics, principles of inheritance, likelihood for pedigree data, aggregation, heritability and segregation analyses, map and linkage analysis, population-based and family-based association studies and genome-wide association studies.

2. Prerequisites

- Although "we assume no formal training in genetics, we [do] assume familiarity with elementary probability, statistical inference and methods".
- The prerequisite is [STA303-Methods of Data Analysis](#) or equivalent.
- Departmental policy: "We are strictly enforcing prerequisites and co-requisites for all STA courses".

3. Textbook and Lecture Notes

- The teaching will generally follow the book by Laird and Lange: [The Fundamentals of Modern Statistical Genetics](#) (can be accessed online through the UofT library)
- Integrated course notes in pdf format, and any additional materials, will be posted in advance of each lecture

4. Evaluation

- In-class, closed-book midterm (40%), after five lectures – Oct 21, 2019
Make-up midterm exam consists of both closed-book written exam and oral examination.
- In-class, closed-book final exam (60%), during the exam period.

5. Other Important Information

- The instructor will host office hour half hour right before and after each lecture, i.e. Mondays 9:30-10am and 1-1:30pm.
- TA: Fan Wang (baozhi.wang@mail.utoronto.ca); TA office hour will be determined after a doodle poll.
- Some statistical genetics programs will be briefly discussed, but there will be no hands-on computing labs or R programming. R codes used by the instructor will be made available.