

**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)
- Instructor will provide additional materials.
- Integrated course notes in pdf format will be posted in advance of each lecture.

**4. Evaluation**

- In-class closed book midterm (40%), after five-six lectures.
- 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. Tuesdays 9:30-10am and 1-1:30pm.
- TA: Lin Zhang ([linzhang@utstat.toronto.edu](mailto:linzhang@utstat.toronto.edu)); TA office hour will be determined after a doodle pool.
- 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.