

Course Syllabus

Adjunct Professor : Nan Laird

Course	Statistical Genetics		
Credit	1	Method of Teaching	Lecture
Objective The emphasis of this course is on understanding basic concepts and methods and how they can be applied in the health sciences.			
Outline This course is a brief introduction to statistical methods for genetic studies. We will provide basic background in human, molecular and statistical genetics and gene mapping techniques, focusing on association analysis. A background in statistical methods is a necessary prerequisite. Basic concepts of human and molecular genetics will be covered in class.			
Class Schedule (90 minutes each) <ol style="list-style-type: none">1. Background in molecular genetics and epidemiology, terminology. (15 Jan Tue 9:00-10:30) <i>Reading: Chapters 1</i>2. Mendel's Laws, genetic models for disease. (15 Jan Tue 11:00-12:30) <i>Reading, Chapters 2</i>3. Basic concepts of Population Genetics. (16 Jan Wed 9:00-10:30) <i>Reading, Chapter 3.1 to 3.3.2</i>4. An overview of gene mapping strategies. (16 Jan Wed 11:00-12:30) <i>Reading, Chapter 5.1, 5.3-5.6</i>5. Association analysis using unrelated individuals. (17 Jan Thu 9:00-10:30) <i>Reading, Chapter 7.1-7.6, 7.8</i>6. Adjusting for Population Stratification. (17 Jan Thu 11:00-12:30) <i>Reading, Chapter 8</i>			

7. Family Based Association Analysis. (18 Jan Fri 9:00-10:30)

Reading, Chapter 9.1-9.2

8. Genome Wide Association Studies (GWAS) (18 Jan Fri 11:00-12:30)

Reading, Chapters 11.1-11.2, 11.5

We add seminars by Japanese teachers for each to assist students with difficulty in language/background knowledge

Text

The Fundamentals of Modern Statistical Genetics, Nan Laird and Christoph Lange, Springer 2011

Related readings

Will be made available in advance of the lecture

Achievement evaluation

There will be a written final exam after the completion of the course.