Genetics Course Outline - Spring 2014
Lectures: Mondays and Thursdays 10:00-11:40 (Zhiyuan Room 602)
Literature Discussions: Tuesdays 14:00-16:00 (Zhiyuan Room 602)

TEXT: **Introduction to Genetic Analysis, 10th Edition** by Griffiths, Wessler, Carroll and Doebley (2012), W. H Freeman and Company. ISBN 1-4292-2943-8.

Topics	**Lecturer/Reading materials**
Feb 24-Feb 27	Wu Fang
Single gene inheritance	2: 29-54.
DNA: structure and replication	1:1-8; 8:279-303
March 3-13	Jade Wang
Genetic transmission in bacteria and phage	5: 159-191.
From physics to classical bacteria genetics	
Recombination and mutagenesis in bacteria	
Bacterial genetic and genomic methods	
Reg of gene exp in bacteria and viruses	12:407-436.
Primary literature discussions:	
March 4	Crick et al., (1961) Nature 192: 1227-1232.,
March 11	Barrangou et al., (2007), Science, 315:1709-1712.
Quiz 1:	
March 13, last 25 minutes of class.	
March 17-March 27	Xin Sun
Independent assortment of genes	3: 78-106
Allele types and gene interactions	6: 199-223
Human pedigree analysis	2:54-65.
Genetic control of Development	14:473-507

Forward vs reverse genetics	1:17; 2:46-50; 11:395-404 15:538-541
Model organisms	21-23, 206,477,500,731-746

Primary literature discussions:

March 18	J Biol. 8(4):35. WormBook. 2006 Jun 14:1-19.
March 25	Nature 287:795-801; Nusslein-Volhard Nobel lecture 1995.

Quiz 2:
March 27, last 25 minutes of class.

March 31-April 3	Fang Wu
RNA: transcription and processing	1:9-10; 9:311-334
Protein: translation	1:10-11; 10:337-362

Quiz 4:
May 1, last 25 minutes of class.

April 7-17*	Jing Zhang
Transposable elements	16:545-573
Mutation, repair, recombination and cancer	17:575-606
Large chromosome changes	7:235-270

(*April 7 lecture shifted to ?)

Primary literature discussions:

April 8	Nature 436, 272-276 (2005)
April 15	Nature 297, 474–478 (1982)

Quiz 3:
April 17, last 25 minutes of class.

April 21-May 15*	Zheng Yuan
Mapping eukaryote chromosome by recombination (Apr 12)	4: 115-149
Regulation of gene expression in eukaryotes (Apr 24)	13:439-470

Gene isolation and manipulation (Apr 28)	1:18-21, 11:367-404
Genetics, flower diversity (May 5)	Special topic.

The students will be divided into 3 groups and each group will give one topic presentation (5 mark)

May 8 Paper discussion: Plant Hormone (strigolactone)
Nature. 2013 Dec 19; 504(7480):406-10
Nature. 2013 Dec 19; 504(7480):401-5

May 12 Paper discussion: Non-Mendelian Inheritance
Plant Cell. 2010 Jul; 22(7):2402-16.
Proc Natl Acad Sci U S A. 2008 Apr 22; 105(16):5980-5.

May 15 Paper discussion: Site-directed mutagenesis
Trends Biotechnol. 2013 Jul; 31(7):397-405.
Nat Biotechnol. 2013 Mar; 31(3):251-8.
Cell. 2013 Sep 12; 154(6):1380-9.

Could be changed if you have more interesting topic.

Quiz 5: May 15, last 25 minutes of class.

May 19-May 29	Qiang Chang
Population Genetics	18: 609-651
Inheritance of complex traits	19: 655-696
Evolution of genes and traits	1:14-17; 20: 699-728

Primary literature discussions:

May 20	Cell 152:703-713.
May 27	Cell 152:691-702.

Quiz 6:
May 29, last 25 minutes of class.

June 3-12* （June 3 class for first lecture）	Ruth Sullivan
Genomes and genomics	15:509-542

Epigenetics in diseases.	Special topic.
Genetic background modification of phenotypes.	Special topic.
Genetics of microbe/host interactions.	Special topic.
Genetics, stem cells and regeneration.	Special topic.

Primary literature discussions:

Date to be determined	Paper 1.
June 10	Paper 2.

Final Exam: date to be determined.

Grading:

Grades will be determined based on your performance in 6 quizes (each 10%) and the final exam (40%).