

**Course: Genomics****Instructor: Ka-Lok Ng****Course description**

This course studies the genomes of organisms. The field includes intensive efforts to determine the entire DNA sequence of organisms and fine-scale genetic mapping efforts. The field also includes studies of intragenomic phenomena such as heterosis, epistasis, pleiotropy and other interactions between loci and alleles within the genome. Research of single genes does not fall into the definition of genomics unless the aim of this genetic, pathway, and functional information analysis is to elucidate its effect on, place in, and response to the entire genome's networks.

**References**

Genomes. 2nd edition

Brown T.A.

BIOS Scientific Publishers Ltd.

Genomics

Benfey P.N. and Protopapas A.D.

Prentice Hall

A primer of Genome Science. 2ed. Edition

Gibson Greg and Musc Spencer

Sinauer Associates Inc.

**Course Schedule**

Basic molecular biology, DNA transcription

Aims of genomics science, mapping genomes

Human/Animal genome projects Plant/Microbial genome projects

Automated DNA sequencing

Genome sequencing

Functional annotation and gene family clusters

Introduction of Single Nucleotide Polymorphism (SNP)

Application SNP technology and SNP discovery

Mid-term exam

Gene expression - Microarrays SAGE and microbeads

Single gene analysis

Gene expression database

Functional proteomics

Structural proteomics

Comparative genomics

Using DNA microarray to assay gene expression

Proteomics and protein identification

Final exam.

**Course evaluation**

Passing score for graduate course is 70. In general, score is allocated between class attendance, homework, mid-term written exam, final written exam and student oral presentation. Course instructor reserves the right to adjust the grading scheme.