

## Genetics

CREDIT	3	INSTRUCTOR	Jon Soderholm
OFFICE	Baek Yang Hall S302	OFFICE HOURS	
TIME	11:00 ~ 12:40	CLASSROOM LOCATION	
E-MAIL	jfsoder@yonsei.ac.kr		

### [COURSE INFORMATION]

COURSE DESCRIPTION & GOALS	<p>The study of genetics focuses on understanding phenotypic variation and the mechanisms underlying inheritance. The processes that participate in converting an individual's genotype into the phenotypes displayed by that individual are of particular interest and importance. In this course we will discuss the fundamental properties of genes and the various approaches to genetic analysis, as it is performed in several different model organisms. When applicable, we will discuss current examples of genetics issues that arise in the literature or in the media and link these examples to topics covered in class.</p>
PREREQUISITE	<p>Freshman-level Biology required; basic Organic Chemistry is also useful although not required.</p> <p>NOTE: THIS COURSE IS A SOPHOMORE-LEVEL COURSE DESIGNED FOR LIFE SCIENCE MAJORS</p>
COURSE REQUIREMENTS	<p>Students are required to attend all lectures and complete all quizzes and exams. PLEASE NOTE THAT THERE IS NO LABORATORY COMPONENT FOR THIS COURSE.</p>
GRADING POLICY	<p>Final grades will be based on a midterm and a final exam plus four quizzes. The midterm and final exams will each be worth 120 points and 40% of the final grade. Each quiz is worth 15 points and 5% of the final grade. Attendance is mandatory and failure to attend class will result in a grade reduction.</p>
TEXTS & REFERENCES	<p>An Introduction to Genetic Analysis Griffiths, et al. 11th Edition W.H. Freeman and Company, New York</p>
INSTRUCTOR'S PROFILE	<p>Jon Soderholm, PhD, Associate Professor, Underwood International College and College of Life Science and Biotechnology, Yonsei University B.S. in Zoology, The University of California, Davis PhD in Molecular Genetics and Cell Biology, The University of Chicago Postdoctoral Fellow, The University of California, Berkeley</p>

[WEEKLY SCHEDULE]

WEEK (PERIOD)	WEEKLY TOPIC & CONTENTS	COURSE MATERIAL & ASSIGNMENTS	REFERENCE
1	<ul style="list-style-type: none"> <li>-Review: Genes and the central dogma of biology</li> <li>-DNA structure</li> <li>-Analysis of single gene inheritance patterns</li> <li>-Independent assortment of genes</li> <li>-Inheritance of organelle genes</li> </ul>		Griffiths, et al. Chapters 1-3
2	<ul style="list-style-type: none"> <li>-Mapping eukaryotic chromosomes by recombination</li> <li>-Mapping with molecular markers</li> <li>-Centromere mapping</li> <li>-The genetics of bacteria and their viruses</li> </ul>		Griffiths, et al. Chapters 4,5
3	<ul style="list-style-type: none"> <li>-Gene interactions</li> <li>-interactions between multiple alleles of a single gene</li> <li>-interactions between multiple genes in pathways</li> <li>-Regulation of gene expression in prokaryotes: the lac operon</li> </ul>		Griffiths, et al. Chapters 6,11
4	<ul style="list-style-type: none"> <li>-Transposable elements in prokaryotes and eukaryotes</li> <li>-Mutations: forms and mechanisms</li> </ul>		Griffiths, et al. Chapters 15,16
5	<ul style="list-style-type: none"> <li>-Mutations: forms and mechanisms</li> <li>-DNA repair mechanisms</li> <li>-Recombination mechanisms</li> <li>-Gene conversion</li> <li>-Large-scale chromosome changes</li> </ul>		Griffiths, et al. Chapters 16,17
6	<ul style="list-style-type: none"> <li>-Recombinant DNA technologies</li> <li>-Genetic engineering</li> </ul>		Griffiths, et al. Chapter 10