



## COURSE INFORMATION SHEET

### **BIOLOGY 211 PRINCIPLES OF GENETICS**

(Tentative course outline and schedule for Fall 2009)

**Instructor:** Dr. Jessmi Ling

**Office:** A2158

**Email:** jling@ambrose.edu

**Telephone:** 1-403-410-2000 ext. 2919

**Lecture venue and time:** A2145. Wednesdays and Fridays, 11:15 am – 12:30 pm

**Course prerequisites:** Biology 131 and 133

#### **Course description and objectives**

Genetics is a study of the structure and function of the genetic material of organisms. This course introduces students to the fundamentals of genetic information and analysis. The course begins with linking genes to phenotype, and therefore the study of gene inheritance. Following which, topics are discussed in a gradual shift toward the molecular aspects of gene structure, function and regulation. Students taking this course are required to enroll in Bio 211L, which encompass the laboratory accompaniment for this course.

#### **Course objectives:**

The course will cover both classical and molecular genetics. It is the aim of the course that students acquire the following skills:

1. Understand the principles of gene inheritance and statistical analysis.
2. Understand the molecular study of genetics.
3. Able to present and discuss issues regarding genetic analysis.

#### **Required textbook:**

Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. Introduction to Genetic Analysis. (9<sup>th</sup> Edition). W.H. Freeman and Co. New York.

#### **Tentative schedule:**

<b>Date</b>	<b>Topic</b>	<b>Chapter</b>
Sept 9	Introduction to the course.	1
Sept 11	Single-gene inheritance A	2.1 – 2.3
Sept 16	Single-gene inheritance B	2.4 – 2.6

Sept 18	Independent assortment of genes	3
Sept 23	Mapping of the eukaryotic chromosome A	4.1 – 4.4
Sept 25	Mapping of the eukaryotic chromosome B	4.5 – 4.8
Sept 30	Community/Program Day (no lectures)	
Oct 2	Test 1 (Sept 9 – 25).	
Oct 7	Bacterial genetics and viral DNA	5.2 – 5.6
Oct 9	Gene interaction	6
Oct 14	DNA structure	7.1 – 7.3
Oct 16	DNA replication	7.4 – 7.7
Oct 21	Test 2 (Oct 7 - 16)	
Oct 23	The central dogma: Transcription	8
Oct 28	The central dogma: Translation	9
Oct 30	Regulation of gene expression: Prokaryotes	10
Nov 4	Regulation of gene expression: Eukaryotes	11
Nov 6	Test 3 (Oct 23 – Nov 4).	
Nov 11	Remembrance Day (no lectures)	
Nov 13	Genomes and genomics	13
Nov 18	The dynamic genome	14
Nov 20	Mutation, repair and recombination	15
Nov 25	Large-scale chromosomal changes	16
Nov 27	Application of genetic engineering	20.6
Dec 2	Test 4 (Nov 13 – Nov 27)	
Dec 4	Ethical issues in genetics debate	
Dec 9	Report deadline and course review	

**Mark distribution:**

Presentation and report	10%
Tests (3 x 20%)	60%
Final exam	30%

Tests will consist of short answer questions based on topics covered during lectures. The tests are not cumulative. Each test carries 20% of the total course marks. The higher scores in three of the four tests will be used to calculate the final course marks and grade. The final exams will consist of multiple-choice questions, short and long answer questions. Questions will be based on topics covered during lectures, corresponding chapters from the required textbook as well as any additional reading material provided over the duration of the course. The final exam will cover topics from the whole course (cumulative).

**Grading scheme:**

A+	93 – 100%	C+	66 – 69%
A	86 – 92%	C	62 – 65%
A-	82 – 85%	C-	58 – 61%
B+	78 – 81%	D+	54 – 57%
B	74 – 77%	D	50 – 53%
B-	70 – 73%	F	Below 50%