UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE: September 1995
COURSE REVISED IMPLEMENTATION DATE: September 2008
COURSE TO BE REVIEWED: October 2009
(Four years after UPAC final approval date) (MONTH YEAR)

OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **Faculty of Science, Health & Human Services/Biology**

BIO 406		**3**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

Advanced Genetics
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course provides for a detailed discussion of the molecular basis and practical aspects of genetic recombination and mutation. The influence of genetic change through mutation and recombination on populations and quantitative traits will also be discussed.

PREREQUISITES: **BIO 220. BIO 201 and BIO 202 are strongly recommended.**
Note: As of September 2009, prerequisites will change to the following:
BIO 201, BIO 202, and BIO 220.

COREQUISITES:

SYNONYMOUS COURSE(S)
(a) Replaces: **n/a** *(Course #)*
(b) Cannot take: **n/a** *(Course #)* for further credit.

SERVICE COURSE TO: *(Department/Program)* *(Department/Program)*

TOTAL HOURS PER TERM: **60**
STRUCTURE OF HOURS:

Lectures:	**45**	Hrs
Seminar:		Hrs
Laboratory:		Hrs
Field Experience:		Hrs
Student Directed Learning:		Hrs
Other (Specify): tutorials	**15**	Hrs

TRAINING DAY-BASED INSTRUCTION
LENGTH OF COURSE:
HOURS PER DAY:

MAXIMUM ENROLLMENT: **36**
EXPECTED FREQUENCY OF COURSE OFFERINGS: **annual**

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☒ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

AUTHORIZATION SIGNATURES:

Course Designer(s): Ernest Kroeker
Chairperson: Gillian Mimmack *(Curriculum Committee)*
Department Head: Barbara Moon
Dean: Wanda Gordon
UPAC Approval in Principle Date:
UPAC Final Approval Date: May 23, 2008

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

Upon successful completion of this course the students should be able to:

a. map genes on eukaryotic chromosomes given appropriate data.

b. describe mechanisms of chromosome mutation resulting in changes in structure and number of chromosomes.

c. describe mechanisms of genetic change based on mutation, recombination, and transposable elements.

d. explain concepts of heritability and genetic variability and identify the significance of these concepts.

e. estimate the number of genes affecting a trait

f. explain how populations change over time due to genetic variability and selection.

g. show a marked improvement in analytical and problem-solving skills.

METHODS:

A combination of lectures and small group tutorials emphasizing problem-solving.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR (Please check:) ☒ Yes ☐ No

METHODS OF OBTAINING PLAR:

Interview and examination

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

An Introduction to Genetic Analysis, 8th ed.

Griffiths, Miller, Suzuki, Lewontin, Gelbart

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Midterm exam	35%
Assigned problems	15%
Final exam	50%

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

Topics will include:

I. Special Eukaryotic Chromosome Mapping Techniques

a. application of mapping functions

b. analysis of single meioses

c. mitotic recombination

d. mapping human chromosomes

II. Chromosome Mutations

a. changes in chromosome structure
b. changes in chromosome number

III. Mechanism of genetic change
a. gene mutation
b. recombination
c. transposable elements

IV. Quantitative genetics
a. heritability
b. estimating number of genes affecting a trait
c. analyzing sources of variance

V. Population genetics
a. sources of variation
b. sexual reproduction and variation
c. selection
d. balanced polymorphisms