douglas college **Course Information**

A: Division: ACADEMIC DATE: August, 1991

B: Department: SCIENCE & MATHEMATICS New Course: _____

Revision of Course Information form: X

DATED: April, 1977

C: Subject & Course No.	D: Descriptive Title	E: Semester Credit
BIOLOGY 320	GENETICS	5

F: Calendar Description

This course is a study of the principles of genetics, including the transmission, exchange, functioning, and other properties of the genetic material in cells, individuals and populations.

Summary of Revisions:
(Enter date & section)
Ex: Section C,E,F, &R

F, G, M, N, O, P, Q, R

G: Type of Instruction: Hours Per Week/ Per Semester

Lecture	_____	Hrs.
Laboratory (Audio-Tutorial)	3	Hrs.
Seminar	2	Hrs.
Clinical Experience	_____	Hrs.
Field Experience	_____	Hrs.
Practicum	_____	Hrs.
Shop	_____	Hrs.
Studio	_____	Hrs.
Student Directed Learning	_____	Hrs.
Other (Tutorial)	2	Hrs.

TOTAL 7 HOURS

H: Course Prerequisites:
BIOLOGY 110 & BIOLOGY 210

I: Course Corequisites:

J: Course for which this course is a pre-requisite

K: Maximum Class Size:
20

L: College Credit Transfer X

College Credit Non-Transfer _____

M: Transfer Credit:
Requested _____
Granted X
Specify Course Equivalents or Unassigned Credit as Appropriate

U.B.C. 200 Level credit (Genetics) (1.5)
S.F.U. BISC 202 (3)
U. Vic. BIOL 300 (1.5)
OTHER:

L. J. Mills
COURSE DESIGNER(S)

L. A. Tamboulis
DIRECTOR/CHAIRPERSON

DIVISIONAL DEAN

P. H. Jones
REGISTRAR

N: TEXTBOOKS AND MATERIALS TO BE PURCHASED BY STUDENTS

Gardner, E., Simmons, M., and Snustad, D., 1991. Principles of Genetics (8th Edition). New York: John Wiley & Sons Inc.

Biology 320 Study Guide. Douglas College

O. COURSE OBJECTIVES

Upon completion of this course, the student will be able to demonstrate an understanding of the principles of classical and modern genetics, including being able to:

1. describe the processes of mitosis and meiosis and their significance in heredity.
2. describe the experimental basis of Mendelian inheritance.
3. describe non-Mendelian inheritance, including linkage, sex-linkage, sex-influenced inheritance, sex-limited inheritance, holandric inheritance, multiple allelism, multigenic inheritance, and extra-chromosomal inheritance.
4. derive chromosome maps by a variety of techniques, including the analysis of:
   - testcross data in higher organisms
   - tetrad data in fungi
   - interrupted mating experiments in bacteria
5. describe sex determining mechanisms in a wide variety of organisms.
6. interpret pedigrees to determine possible modes of inheritance of genetic anomalies in humans.
7. describe the cytological and biochemical basis of mutation and mutagenesis.
8. describe the structure, replication, and functions of nucleic acids.
9. describe the process of protein synthesis and the control of protein synthesis in bacteria and higher organisms.
10. describe the genetic control of metabolism.
11. describe Hardy-Weinberg equilibrium and its application to the determination of the effects of selection on allele frequencies.
12. perform and interpret genetic experiments with a variety of organisms.
13. describe the genetic basis of evolutionary theory.
14. research, prepare and make a seminar presentation on a genetic topic.

P. COURSE CONTENT

The major topics in the course include the following:

1. Mechanics of Inheritance, including:

    - mitosis
    - meiosis
    - life cycles
    - crossing-over.

2 Mendelian Inheritance, including:

    - monohybrid inheritance
    - dihybrid inheritance
    - allelic relationships

3. Probability and Statistics (including Chi Square test)

4. Non-Mendelian Inheritance, including:

    - linkage
    - sex-linked inheritance
    - sex-influenced inheritance
    - sex-limited inheritance
    - holandric inheritance
    - multiple allelism
    - multigenic inheritance
    - extra-chromosomal inheritance

5. Chromosome mapping

6. Sex determination and sex differentiation

7. Mutation and mutagenesis

8. Nucleic acid structure and replication

9. Protein Synthesis

10. Genetic control mechanisms

11. Microbial genetics

12. Population genetics and evolution

R. COURSE EVALUATION

TYPE OF EVALUATION		POINTS
Weekly Class Evaluations		30
Laboratory Evaluations		
Seminar Presentation		10
Comprehensive Examinations	- midterm	30
	- final	30
	TOTAL	100

GRADES: **A**$^{+}$ 92-100 **A** 87-91 **A**$^{-}$ 82-86 **B**$^{+}$ 77-81 **B** 72-76 **B**$^{-}$ 67-71

C^{+} 62-66 **C** 57-61 **C**$^{-}$ 53-56 **P** 50-52 **F** 0-49

Notes:

1. Weekly Class Evaluations:

   Each week (for 10 weeks) there will be written evaluations in class based on the course objectives and other material covered in the previous week. The best 9 out of 10 evaluations will be averaged to determine this portion of the grade.

2. Laboratory Evaluations:

   Approximately six laboratory experiments will be conducted during the semester. The experiments must be completed in the laboratory by the date assigned for each experiment. The laboratory experiments are an integral part of the studies of particular topics. Failure to complete an experiment will result in a loss of 3 marks from the weekly evaluations for each assignment not completed.

3. Seminar Presentation

   A seminar presentation is an oral presentation. It involves research of an assigned topic, preparation and presentation to the class.

4. Comprehensive Examinations:

   A mid-term and a final examination will be worth 30 marks each. The mid-term examination will cover all material covered prior to the examination. The final examination will cover the entire course. If the student achieves a better grade on the final exam than on the mid-term examination, the mid-term grade will be raised to equal that achieved on the final examination.