Douglas College

EFFECTIVE: SEPTEMBER 2003

CURRICULUM GUIDELINES

A: Division: **Science and Technology**

B: Department/ Program Area: **Biology Department**

Date: **May 2002**

New Course | | Revision | **X**

If Revision, Section(s) Revised: **A B F G H K M N O P Q R**

Date Last Revised: **August 1991**

C:	**D:**	**E:**
Biology 320	**Genetics**	**5**
Subject & Course No.	Descriptive Title	Semester Credits

F: Calendar Description: This course is a study of the principles of genetics. Topics covered include the physical and chemical basis of heredity, genetic analysis in eukaryotes, prokaryotes and viruses, mutation, population genetics and evolution.

G: Allocation of Contact Hours to Types of Instruction/Learning Settings

Primary Methods of Instructional Delivery and/or Learning Settings:

Lecture/ Tutorial/ Laboratory

Number of Contact Hours: (per week / semester for each descriptor)

Lecture/ Tutorial **4 hours/week**
Laboratory **3 hours /week**

Number of Weeks per Semester: **14**

H: Course Prerequisites:

Biology 210 with C - or better grade or permission of instructor

I. Course Corequisites:

None

J. Course for which this Course is a Prerequisite:

None

K. Maximum Class Size:

27

L: PLEASE INDICATE:

[ ] Non-Credit

[ ] College Credit Non-Transfer

[X] College Credit Transfer: Requested [ ] Granted [X]

SEE BC TRANSFER GUIDE FOR TRANSFER DETAILS (www.bccat.bc.ca)

M: Course Objectives/Learning Outcomes

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

1. describe the physical basis of heredity.

2. describe the experimental basis of Mendelian inheritance.

3. describe sex determining mechanisms in a wide variety of organisms.

4. describe non-Mendelian inheritance, including linkage, sex-linkage, sex-influenced inheritance, sex-limited inheritance, holandric inheritance, multiple allelism, multigenic inheritance, and extra-chromosomal inheritance.

5. interpret pedigrees to determine modes of inheritance of genetic anomalies in humans.

6. derive chromosome maps by a variety of techniques, including the analysis of:

    - testcross data in higher organisms
    - tetrad analysis in fungi
    - conjugation experiments in bacteria

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 the genetics of populations, including Hardy-Weinberg equilibrium, genetic drift, the effects of selection on allele frequencies and the evolutionary implications of population genetics.

12. perform and interpret genetic experiments with a variety of organisms.

13. describe the genetic basis of evolutionary theory.

14. use general principles of genetics to discuss current issues.

N: 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. Viral Genetics

13. Population genetics

14. Evolution

O: Methods of Instruction

This course involves four hours per week of classroom instruction and three hours per week of laboratory activity. Classroom work will include lectures and tutorials, and is integrated with textbook, scientific journal readings and problem assignments. The laboratory work is designed to complement the theory content of the course.

P: Textbooks and Materials to be Purchased by Students

Snustad, P.D., and Simmons, M.J., 2000. *Principles of Genetics* (2nd Edition). New York: John Wiley & Sons Inc.

Q: Means of Assessment

TYPE OF EVALUATION	POINTS
Class tests & assignments	10 - 20
Mid Term Exam	15 - 35
Final comprehensive Exam	35
Essay	5 - 10
Lab reports (6)	10 -15
TOTAL	100

Grades: A^+ 95-100, A 90-94, A^- 85-89, B^+ 80-84, B 75-79, B^- 70-74, C^+ 65-69, C 60-64, C^- 55-59, P 50-54, F 0-49

R: Prior Learning Assessment and Recognition: specify whether course is open for PLAR

There is no provision for PLAR, other than normally done by examining transcripts and comparing course outlines of biology courses taken within the last five years to the Biology 320 course outline.

Course Designer(s) | Education Council/Curriculum Committee Representative

Dean/Director | Registrar