

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, 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:
 - 6.1. testcross data in higher organisms
 - 6.2. tetrad analysis in fungi

4. Non-Mendelian Inheritance, including:
 - 4.1. linkage

17. Population genetics and evolution, including:
 - 17.1. Hardy-Weinberg equilibrium
 - 17.2. effects of genetic drift and selection

18. Laboratory Exercises
 - 18.1. mitosis in onion roots
 - 18.2. chi square (corn crosses)
 - 18.3. gene mapping in *Drosophila*
 - 18.4. polytene chromosomes
 - 18.5. plant viruses
 - 18.6. population genetics (models of drift and selection; field study)

DOUGLAS COLLEGE SIGNATURE ELEMENTS:

Core Competencies:

- a. Oral, written and interpersonal communication:

Laboratory assignments, in-class assignments, problem sets and all examinations in this course will

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 tutorial