COURSE INFORMATION FORM

DISCIPLINE
Biology

COURSE TITLE
Principles of Genetics

CR.HR    4  LECT HR.    3  LAB HR.    3  CLIN/INTERN HR.    __  CLOCK HR.    __

CATALOG DESCRIPTION

Basic principles of heredity in animals, plants, and microorganisms. Mendelian and other principles of transmission genetics and cytogenetics. Molecular genetics of gene structure and function. Introduction to population genetics.

PREREQUISITES

BIOL 101 or BIOL 104 or BIOL 106 or BIOL 123 or BIOL 124

EXPECTED STUDENT OUTCOMES IN THE COURSE

Upon completion of this course, the student will be able to:

1. Apply Mendelian principles of inheritance to sexually reproducing organisms. (NPS A; CT C)
2. Apply post-Mendelian principles of inheritance to sexually reproducing organisms. (NPS A; CT C)
3. Identify the structural components of genetic material from the nucleotide to the chromosomal level. (NPS B, D)
4. Explain the molecular processes that occur as DNA replication takes place in the cell. (NPS B, D)
5. Explain the molecular processes that occur as cells produce proteins. (NPS B, D)
6. Apply the techniques of molecular biology to the study of DNA. (NPS A; CT C)
7. Apply the techniques of cytogenetics to the study of chromosomes. (NPS A; CT C)
8. Explain principles of population genetics to explain how and why groups of organisms change. (NPS B, D)
CLASS-LEVEL ASSESSMENT MEASURES

Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

1. Written examinations (1, 2, 3, 4, 5, 6, 7, 8)
2. Collection, analysis, and interpretation of data (1, 2, 6, 7)
3. Written laboratory reports (1, 2, 6, 7)
4. Reports or discussions of readings from current scientific literature (3, 4, 5, 8)
5. Written paper using correct format and style for biological literature (1, 2, 3, 4, 5, 6, 7, 8)

PROGRAM-LEVEL OUTCOMES ADDRESSED

General Education Outcomes
Specify which general education outcomes, if any, are substantially addressed by the course by completing the “Course/Program Assessment Matrix” to show the relationship between course and program outcomes and assessment measures.

(See Expected Student Outcomes)

Occupational Program Outcomes
Specify which occupational program outcomes, if any, are substantially addressed by the course by completing the “Course/Program Assessment Matrix” to show the relationship between course and program outcomes to assessment measures.
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Transmission genetics
   A. The cell
   B. Mitosis
   C. Meiosis
   D. Mendelian principles
   E. Post-Mendelian principles

II. Cytogenetics
   A. Chromosome morphology
   B. Chromosome aberrations
   C. Chromosome number
   D. Crossing over
   E. Sex determination

III. Genetic material
   A. Characteristics of DNA and RNA
   B. Evidence of DNA as the genetic material
   C. DNA and RNA structure
   D. DNA replication

IV. Genetic expression and variation
   A. The genetic code
   B. Transcription
   C. Translation
   D. Proteins
   E. Mutations
   F. Regulation

V. Population genetics and evolution
   A. Populations
   B. Hardy-Weinberg equilibrium
   C. Agents of change