1. Catalog description
   a. BIO 3001G
   b. Heredity and Society
   c. 3-0-3
   d. F, S, Su
   e. Heredity Society
   f. A course for non-science majors that addresses the ethical, political, and social implications of heredity and modern genetic technology. Basic genetic principles as well as contemporary issues in biotechnology will be studied. Does not count toward the Biological Sciences major or minor. Not open to those students with credit for, or registration in, BIO 3200.
   g. None
   h. Spring 2004

2. Objectives and evaluation of the course
   a. The objectives of the course are 1) to present genetic topics as science, relating them to contemporary issues in human society, 2) to provide scientific information to give students a foundation in genetics and to help them make sound judgments on genetic subjects, especially as they relate to ethical, legal, political, and economic issues, and 3) to provide a forum for expression of all sides of controversial issues so that exposure to diverse viewpoints may lead to new understandings.
   b. In accordance with the goals of general education, students will 1) obtain fundamental knowledge of the sub-disciplines within the field of genetics - molecular, cellular, organismal, and population genetics – to establish a framework for discussion (critical thinking, writing, speaking), understand the unifying principles of genetics and how they extend to all organisms (critical thinking), become conversant with current genetic technologies, especially as they apply to medicine, forensics, agriculture, societal practices, public policy, and national and global legislation (critical thinking, citizenship), have opportunities to communicate their understanding of current readings relating to genetics from a variety of sources (writing, speaking, citizenship), and become aware of the physical and biotic factors influencing the evolution of the organic world (critical thinking, citizenship).
   c. Methods of assessing students’ achievement of the preceding objectives will include 1-2 position papers on a controversial topic related to genetics, 1-3 short content-based reports on topics such as a person associated with genetics, a genetic technology, and a model organism used in genetic research, and/or frequent short, in-class writing assignments on current ethical issues related to genetics. In addition, students will be required to develop, research, and present (time permitting) a project that relates both to genetics and to their major field of study, or some other special interest. Also, students will assemble a journal of items from the news media (newspapers, magazines, television news broadcasts, internet news broadcasts) which have an explicit connection to genetics.
   d. This course is not numbered 4750-4999.
   e. This course is writing active, as detailed in 2.c..

3. Outline of the course
   a. Week one
      • Introduction and course objectives
      • Science and non-science
      • The science of genetics
Week two
- Cells are the basic units of all living things
- DNA structure
- DNA replication

Week three
- Gene expression: How proteins are made
- Proteins determine characteristics
- Molecular Mutation

Week four
- Chromosome structure
- Cell division – Mitosis and the cell cycle
- Exam I

Week five
- Cell division – meiosis and sexual reproduction
- Transmission genetics - Mendel I
- Transmission genetics - Mendel II

Week six
- Modifications and exceptions to Mendelian genetics
- Development and sex determination
- Pedigree analysis

Week seven
- Autosomal inheritance patterns
- Sex-linked inheritance patterns
- Genetic screening

Week eight
- Genetic counseling
- Reproductive technologies
- Exam II

Week nine
- Recombinant DNA – What is it?
- Recombinant DNA technologies
- Recombinant DNA technologies

Week ten
- Cloning
- Genetics of Cancer
- Genetics of the Immune system

Week eleven
- Genetics of Behavior
- Introduction to Population genetics
- Genes in populations

Week twelve
- Selection and adaptation
- Human diversity and evolution
- Exam III

Week thirteen
- The Human Genome
- The Human Genome
- Intellectual property rights

Week fourteen
- presentations

Week fifteen
- presentations
4. Rationale
   a. The overall purpose of the course is twofold: to provide students with a fundamental background in genetic principles and processes common to all life, and to prepare students to make sound, objective decisions as to the current use and future direction of genetics in society. Genetic technologies are fast becoming the standard for a wide range of human activities, including medical interventions and therapies, forensic analysis and criminology, environmental and ecological assessment, phylogeny and anthropology, economic improvement, and human rights issues. Emerging genetic technologies will no doubt continue to provide a better understanding of the impact of genetics on other issues confronting society, including complex processes such as human behavior.
   b. This course has no prerequisites; however, it is designed for junior and senior-level students who are likely to have completed their writing-centered coursework and have developed an ability to analyze complex issues and synthesize informed opinions.
   c. This course is a revision of the current, 2-hour Heredity & Society course (BIO 3001G). Although this course covers many of the same fundamental topics as BIO 3200 (Genetics), the material is covered in much less depth and emphasizes, rather, the breadth of applications and implications of genetics to societal issues.
   d. As stated in the catalog, this course will not be required for any major program other than general education.

5. Implementation
   a. Instructors currently teaching BIO 3001G: Dr. Henry Owen and Dr. Ruth Chesnut. Dr. Gary Fritz has taught BIO 3001G in previous semesters.
   b. Additional costs: None

6. Community college transfer
   A community college course will not be judged equivalent to this course.

7. Date approved by the Department Curriculum Committee: January 11, 2003

8. Date approved by the College Curriculum Committee: May 2, 2003

9. Date approved by the Council on Academic Affairs: August 28, 2003

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