

**Eastern Illinois University  
Revised Course Proposal  
BIO 2003G, Heredity and Society**

**1. Catalog description**

- a) BIO 2003G
- 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. Credit for BIO 2003G will not be granted if the student already has credit for or registration in BIO 2093G or BIO 3200.
- g) No prerequisite
- h) Fall 2006

**2. Student learning objectives and evaluation of the course**

- a) In accordance with the goals of general education, students will:
  - evaluate genetic topics as science, relating them to contemporary issues in human society (speaking, writing, critical thinking)
  - apply sound judgments on genetic subjects, especially as they relate to ethical, legal, political, and economic issues (critical thinking, speaking, writing)
  - describe all sides of controversial issues so that exposure to diverse viewpoints may lead to new understandings (critical thinking, speaking, writing)
  - analyze 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)
  - evaluate the unifying principles of genetics and how they extend to all organisms (critical thinking)
  - describe the current genetic technologies, especially as they apply to medicine, forensics, agriculture, societal practices, public policy, and national and global legislation (critical thinking, citizenship)
  - compare and contrast their understanding of current readings relating to genetics from a variety of sources (writing, speaking, citizenship)
  - evaluate the physical and biotic factors influencing the evolution of the organic world (critical thinking).
- b) Assessment of student learning objectives:

Methods of assessing students' achievement of the preceding objectives will include two position papers (10%) on a controversial topic related to genetics, two short content-based reports (10%) on topics such as a person associated with genetics, a genetic technology, and a model organism used in genetic research, and frequent short,

in-class writing assignments (10%) on current ethical issues related to genetics. In addition, students will be required to develop, research, and present a project (30%) 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 (10%) from the news media (newspapers, magazines, television news broadcasts, internet news broadcasts) which have an explicit connection to genetics and complete three examinations (30%).

	Position papers (10%)	Content-based reports (10%)	Short writing assignments (10%)	Project (30%)	Journal items (10%)	Exams (30%)
Evaluate genetic topics as science	X	X	X	X	X	X
Apply sound judgments on genetic subjects	X	X	X	X	X	
Describe all sides of controversial issues	X	X	X	X	X	
Analyze knowledge of the sub-disciplines within the field of genetics	X	X	X	X	X	X
Evaluate the unifying principles of genetics	X	X	X	X	X	X
Describe the current genetic technologies	X	X	X	X	X	X
Compare and contrast their understanding of current readings relating to genetics	X	X	X	X	X	
Evaluate the physical and biotic factors influencing the evolution of the organic world	X	X	X	X	X	X

- c) Course is not technology-delivered.
- d) Not a graduate level course
- e) The course is writing active. Written position papers, short content-based position papers, and short in-class writing assignments are required in this course.

### 3. Outline of the course

- a) Course outline is based on three 50-minute class meetings each week for 15 weeks.

#### 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

b) Not technology delivered

#### **4. Rationale**

- a) The 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. Given the course content and level of critical thinking, writing, and speaking involved, a 2000-level is appropriate.
- c) This course is a revision of the current 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) This course will not be required for any major or program other than general education.

#### **5. Implementation**

- a) Faculty members to whom the course will be assigned: Dr. Ruth Chesnut or other qualified faculty in the Department of Biological Sciences.
- b) Additional costs: None
- c) Text: Cummings, MR. 2003. Human Heredity: Principles and Issues. Brooks/Cole. Pacific Grove 6<sup>th</sup> ed, California. 488pp.

#### **6. Community college transfer**

A community college course may be judged equivalent to this course.

**7. Date approved by the Department Curriculum Committee:** October 6, 2005

**8. Date approved by the College Curriculum Committee:** 28 October 2005

**9. Date approved by the Council on Academic Affairs:** 16 December 2005