Phil/Biol 2510, Spring 2008
Study Guide for Midterm Exam #1
Bluebook Required

For each exam you will be expected to be familiar with the assigned readings, lectures, and class discussions and be able to discuss intelligently the concepts, issues, arguments, and criticisms involved on the topics covered. The exam will consist of two parts. The first part will be a series (~10) of objective, multiple-choice questions. The second part will consist of two short essays. Below is a list of concepts and issues you are expected to understand. A list of essay questions is also included.

Concepts and Issues

Vitalism and materialism
Structure and components of DNA
Complementarity
Rosalind Franklin
Francis Crick
James Watson
Central dogma
Gene
Promoter and transcription factors
RNA: mRNA tRNA
Amino acids
Proteins: enzymes, ribosomes, polymerase
Mutations: Point, Repeat Expansion, Deletions, Duplications
Mendelian genetics
Phenotype/Genotype
Alleles
Homozygous/Heterozygous
Recessive/Dominant/Semi-dominant
Carrier
Probabilities of inheritance
Inheritable Disease: Single gene, chromosome, multifactorial
Examples: red-green blindness, Tay-Sachs, Huntington's, Turner syndrome, Trisomy 21, cancer
Chromosomes
Linkage and linkage studies
Recombination
Recessive X-linked traits: pattern of inheritance
X inactivation
Cancer
BRCA 1 and 2 genes
Oncogenes and tumor suppressor genes
Stages of cancer progression: mutation and selection, cell death, angiogenesis, metastasis
C. elegans

Ethics framework
  Principle of autonomy (including privacy)
  Principle of beneficence
  Principle of justice (including fairness/equality)
Eugenics: positive and negative
Lessons of eugenics
Genetic essentialism:
Genetic determinism
Genetic axiology
Francis Galton
Charles Davenport
Nazi eugenics
US Eugenic policies: immigration, miscegenation, and sterilization policies
Carrie Buck
Buck v. Bell 1927
Oliver Wendell Holmes
Prenatal screening
Preimplantation genetic diagnosis (PGD)
IVF
Kingsbury and Nash cases
PGD Issues: benefit and harm, procreative autonomy, respect for persons
Genetic Tests
Genetic discrimination
Genes as risk factors
Arguments against genetic discrimination
  Unfair exclusion argument
  Individual and social consequences argument
  Moral expressivism
Arguments "for" some discrimination
  Insurers' access
  Employers' access

Essay Questions: The following list includes eight possible essay questions for Midterm Exam #1. From this list we will pick four questions for the exam, and then you will be expected to write on two of your choice. Each answer should be given in essay form and be as complete and thorough as possible given the space and time for the exam (approximately 2/3 of the allotted time for both essays, and 1/3 for the objective questions). Some recommendations: include as much relevant detail as you can in an organized fashion. We encourage the use of examples to illustrate your points. In your essay, be sure to respond to each part of the essay question. Your goal should be to demonstrate to us that you have a competent grasp of the relevant concepts, processes, issues, arguments, and implications.

A. Explain the central dogma with special attention given to how complementarity is integral to each phase of the central dogma. Name and define each phase for full credit.

B. Describe the stages of cancer progression as discussed in the lecture. Name and define types of cell changes that lead to end stage cancer.

C. Explain why calico cats are always female. How does this relate to Turner syndrome? What is Turner syndrome?

D. Many recessive genetic diseases present in the population lead to death at an early age. By contrast, dominant genetic diseases that circulate in the population tend to affect a person much later in life. Why? Include in your answer an example of each type of disease and how it might be found in a family tree.

E. One of the lessons of the history of eugenics is that it is a cautionary tale: What exactly is this history cautioning us against? In your answer, describe two of the most important lessons of eugenics we are supposed to learn. Is PGD (and/or prenatal screening) a new form of eugenics? Briefly defend your answer.

F. What is the difference between positive and negative eugenics? Give an example of each. Is there an ethical difference between positive and negative eugenics practices/policies? (For example, is one form ethical and the other not; is one more or less ethical than the other? Etc.)

G. Describe how PGD brings the ethical principle of procreative autonomy into conflict with the ethical principle of respect for persons. How should this conflict be resolved (that is, provide a brief argument for which principle should take precedence with regard to the use of PGD)?

H. Is genetic discrimination unethical? In your answer, describe what genetic discrimination is and provide the single most persuasive argument for your view. Include a description *and* response to one counter-argument to your view.