

## **GEN ST 101 C – Genetic Engineering: Ethical and Moral Issues Winter 2012**

Instructors: Jason Babcock & Laura Chen

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Office hours: By appointment – MGH 161H

Course meets: Wednesdays 11:30 -1:20 pm in MGH 284

### **Course Description:**

Human beings have had an impact on the genetics of plants and animals for thousands of years. Through selective breeding, mankind created domesticated plants and animals that allowed for predictable food sources, personal safety, agrarian societies, and the urbanization of the world as we know it today. Recently, technological advancements in the biological sciences have allowed us to move beyond breeding for traits. With the advancements afforded by genetic engineering, we are now able to create and reproduce plants and animals that are resistant to pests and produce more food. As the capabilities of genetic engineering become ever more advanced humans are increasingly looking to utilize the technologies on themselves. We are looking at stem cell research as a potential cure for everything from paralysis to arthritis. Gene therapy is being used to cure color blindness and degenerative diseases. At the same time, parents are looking to sperm selection and embryo design to try to determine the characteristics of their children and athletes are looking to utilize genetic doping to improve their performances. This class will explore the ethical and moral issues that are encountered as humans engineer the genetics of plants, animals, and themselves.

As a course focusing on skills acquisition, how you learn will be as important as what you learn. The first half of this course covers learning skills, graph analysis, biology specific vocabulary, testing, and writing skills embedded within integrated content on the basics of genetics. The second half of the course will focus on applying those skills in the identification and evaluation of ethical and moral issues surrounding plant, animal, and human based genetic engineering. Both study skills and course content will be discussed in the course. In addition, a graduate student or upper level undergraduate mentor will assist in developing the academic and social skills necessary for success at the University of Washington three hours a week outside of class.

### **Course Materials:**

- 1” or 1.5” three ring binder with dividers
- Notebook with lined paper
- Academic Planner

**Grading:**

Students will receive numerical grades on their e-mail essays, professor meeting reports, and the final. Assessment will be based upon the understanding of content as well as an application of the skill and strategies presented in class. A grade will be issued for each activity worth a certain percentage of the final grade. **All assignments and quizzes must be submitted to complete the course.** Students are expected to attend every class. Students will receive a grade for the course based on their successful completion of the following requirements:

- Participation and Attendance 25 points
- Weekly assignments and quizzes 35 points
- In-Class Essay 15 points
- Final Exam 25 points

*At the end of the quarter, if you have demonstrated extraordinary commitment to and engagement with your tutor-mentor, you may receive an extra .1 to your final GPA*

Week-2 (1/11/2012)		
Turned in this period	Focus of class	Homework
N/A	<ul style="list-style-type: none"> <li>- Personal introductions, Class overview</li> <li>- Annotating</li> <li>- Philosophical foundations</li> </ul>	<ul style="list-style-type: none"> <li>- Time audit</li> <li>- Read: <i>Genetic modification and genetic determinism</i> by Resnik and Vorhaus and annotate as you read</li> </ul>

Week-3 (1/18/2012)		
Turned in this period	Focus of class	Homework
Time audit	<ul style="list-style-type: none"> <li>- <b>MEET YOUR TUTOR</b></li> <li>- Reviewing philosophies</li> <li>- Introduction to Concept Mapping</li> <li>- <b>Using concept maps as metacognitive tools</b></li> </ul>	<ul style="list-style-type: none"> <li>- Read: <i>Genetic Engineering: Science and Ethics on the New Frontier</i> by Boylan &amp; Brown (2001) chapters 3&amp;4</li> <li>- Concept Map of Boylan and Brown (15 terms)</li> <li>- Quiz on <i>B&amp;B</i> next period</li> <li>- Professor meeting report (due 2-1)</li> <li>- Writing Center assignment (due 2-1)</li> </ul>

Week-4 (1/25/2012)		
Turned in this period	Focus of class	Homework
Concept map of Boylan and Brown	<ul style="list-style-type: none"> <li>- <i>Boylan and Brown</i> Quiz</li> <li>- Concept mapping review of <i>B&amp;B</i> vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>- Read and : <i>Race, Genomics, Identities and Politics in Contemporary Brazil</i> by Santos and Maio</li> <li>- Professor meeting report (due 2-1)</li> <li>- Writing Center assignment (due 2-1)</li> </ul>

Week-5 (2/1/2012)		
Turned in this period	Focus of class	Homework
<ul style="list-style-type: none"> <li>- Professor meeting report</li> <li>- Writing Center assignment</li> </ul>	<ul style="list-style-type: none"> <li>- Sharing Professor meeting experiences</li> <li>- Writing</li> <li>- Discussing identity through the article of Santos &amp; Maio</li> </ul>	<ul style="list-style-type: none"> <li>- Identity essay</li> <li>- Read and annotate <i>Recent developments in gene transfer: Risk and ethics</i> by Kimmelman</li> </ul>

Week-6 (2/8/2012)		
Turned in this period	Focus of class	Homework
<ul style="list-style-type: none"> <li>- Identity essay</li> </ul>	<ul style="list-style-type: none"> <li>- Note taking strategies</li> <li>- Practice writing a thesis</li> <li>- Genetic engineering explained</li> </ul>	<ul style="list-style-type: none"> <li>- Watch and take notes on: <a href="http://www.youtube.com/watch?v=Zzh5TVXaAr4">http://www.youtube.com/watch?v=Zzh5TVXaAr4</a></li> <li>- Read <i>Early Gene Transfer Experiments</i> by Schnelder &amp; Freedman</li> <li>- Bring in Blue Book for in class essay next class period</li> </ul>

Week-7 (2/15/2012)		
Turned in this period	Focus of class	Homework
<ul style="list-style-type: none"> <li>- Notes from Genetic engineering movie (1-2 pages)</li> </ul>	<ul style="list-style-type: none"> <li>- In class essay</li> <li>- Discussing/debating what is good and what is bad in genetic engineering</li> </ul>	<ul style="list-style-type: none"> <li>- Read: <i>Gene Doping in Sports</i> by Schnelder &amp; Freedman <b>And</b> <i>The New Breed</i> (pgs 220-241) from <i>Clones, Genes, and Immortality</i> by Harris</li> <li>- Short answer quiz next class on readings</li> </ul>

Week-8 (2/22/2012)		
Turned in this period	Focus of class	Homework
<ul style="list-style-type: none"> <li>- N/A</li> </ul>	<ul style="list-style-type: none"> <li>- Short answer quiz</li> <li>- Library research using online databases</li> <li>- Debating the merits of G.E. in humans in sports and children</li> </ul>	<ul style="list-style-type: none"> <li>- Find, print, and read: one news article (Google news) <b>and</b> one journal article about UW scientist Jay Neitz's work with gene therapy in which he cured monkeys of their colorblindness</li> <li>- Read <i>Genetic Engineering: Opposing Viewpoints</i> pgs 18-38 and 159-169 by Miller &amp; Conko, Cummings, Avery, and Watch</li> </ul>

Week-9 (2/29/2012)		
Turned in this period	Focus of class	Homework
- Bibliography on two news articles about Neitz	- Sharing articles on Neitz - Discussion and debate about how different scenarios elicit different personal philosophies about genetic engineering	- Final review sheet - Flash Cards - Self Reflection essay (due 6-9-10)

Week-10 (3/7/2012)		
Turned in this period	Focus of class	Homework
N/A	- Review for final exam	Bring Blue Book to Final Exam Self Reflection Essay

Week-11 (3/12/2012)		
Turned in this period	Focus of class	Homework due
- Flash Cards ( <i>optional</i> )	<b><i>FINAL EXAM!!!</i></b>	Self- Reflection Essay Due Extra credit Flash Cards (20+)