Botswana: Development in Southern Africa
Spring 2018
Ethical and Social Issues in Biotechnology in Southern Africa

Instructors:
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Course Description

In this course we will examine development in Southern Africa from the perspective of applications of biotechnology. We will focus on social and ethical issues related to research and implementation of biotechnologies applied to business including agriculture, health including genetic testing and pharmaceuticals, and to the characterization of human populations including eugenics and modern efforts to determine ancestry and migration patterns. As has been the case over time and globally, biotechnology or applied genetics can have critical political, economic, and social consequences. The driving social, political, and economic forces of what technologies are developed and applied will also be considered.

Learning goals
• Effective communication and collaboration
• Identification of social and historical dimensions of genetic practices and applications
• Gain appreciation of the impact of ethical considerations, social practices, and economic priorities on research and applications of genetic technologies in Southern Africa
• Students will gain an appreciation of an interdisciplinary approach to a topic of interest
• Understand the power and limitations of the scientific method so students can critically evaluate claims when scientific explanations and technology are invoked in discussions and applications of policy.
• Understanding fundamental technical concepts and ethical considerations of biotechnology

Course work
A wide variety of formats of coursework will be graded. Oral and written communication skills will be emphasized. Some assigned work will be collaborative. Students are encouraged to collaborate and converse about the readings, classroom discussions, documentaries and supplementary material. Journal entries may reference or be influenced by these conversations although each student is responsible for writing their own entries. Always clearly acknowledge contributions to your work.
Grading scheme
Final grades are based on a weighted average for the term. Grade cutoff points (in terms of percentage of total points) are as follows (as per the University of Botswana system): A = 80-100%; B+ = 75-79.9%; B = 70-74.9%; B- = 65-69.9%; C+ = 60-64.9%; C = 55-59.9%; C- = 50-54.9%; D+ = 45-49.9%; D = 40-44.9%; D- = 35-39.9%; E = < 35%.

Reading Journal entries  30%
Active participation (including mandatory attendance)  20%
Short assignments and quizzes  30%
Research paper and presentation  20%

Reading Journal: purposeful comprehension, retention, application
Every student must outline reading assignments and keep a reading journal. Reading notes should be brought to class – think of them as your GPS for class discussion.
Each journal entry consists of notes from each reading assignment(s), as well as periodic requests for fact-gathering and information. Entries may incorporate comments or reflections about insights & ideas provoked by what you have learned from class discussion, other classes and conversations outside both. Occasionally prompts to include responses to specific questions or assignments may be provided during class.
Weekly journal entries combine outlines, reading notes and may include reflections – but they are not essays). For each item assigned, you should include a brief (1 paragraph or less) summary written in your own voice. Note: estimate writing is 4-8 pages a week.
- Please name files: Last name date journal: Gregg-Jolly 1-29-19 journal, for example. Do not include any special characters in the file name.

Active Participation in Class Discussion: be an active learner
Class discussion represents an exchange of ideas. It is a conversation among peers. Shared perspectives as well as differences of opinion further our own understanding of a topic. Critical thinking and an engaging exchange of ideas depends on listening carefully to another person’s perspective and responding respectfully. The focus should be specifically on what and why there are points of agreement or disagreement -- how is one interpretation different and in what ways should it be valued as more or less persuasive?
All discussions need to be situated within or grounded by the context of assigned readings. These may be supplemented with (not substituted by) outside sources.
Always come prepared to lead a class discussion or to discuss one or more passages: this is why bringing your reading notes is very important. They should include: What are the main points? Identify key passages. What is the significance of the work? What is the logic behind the author’s discussion? What should we remember from the materials and why? How does the reading relate to previous readings, events in the news, and themes of this course?

COURSE SCHEDULE OF TOPICS (*subject to change)
I. Overview
What is biotechnology? Basics of recombinant DNA.
Examples of products and processes
Food and pharma
Genetic testing (disease and ancestry)
Social and ethical issues including safety, political power, economic forces, making ethical decisions, impact of use and misuse of products of biotechnology
II. Biotechnology for business
   A. GMOs in agriculture
      Introduction
      Examples including Golden Rice, Kalahari watermelon
      Politics of food
      Regulation (South and Eastern Africa Consortium).
   B. Other applications including mining and wild-life management

III. Health and biotechnology
   A. GMOs and pharmaceutical research and development
   B. Genetic testing
      Overview of technology and related ethical issues
      Accessibility in underdeveloped areas
      Genetic markers related to HIV and TB, Collaborative African Genomics Network (CAfGEN)
   C. Vaccine development (HIV and Ebola)
   D. Gene drive technology to mitigate spread of malaria
      Overview of technology. Safety, regulatory and ethical considerations.

IV. Applied human genetics
   A. Eugenics
   B. categorization and “racing” populations.
   C. Ancestry and migration
      Case study: San people and ethical conduct of research

Readings and assignments will be drawn from a variety of sources, including the following:


Council for Responsible Genetics (2017) CRISPR & Gene Drives GeneWatch 30 (1)


Galton, F. Chapter XXI. Race Improvement In *Memories of My Life*. [http://galton.org/books/memories/chapter-XXI.html](http://galton.org/books/memories/chapter-XXI.html)


RhODIS (Rhino DNA Index System) http://rhodis.co.za/


