MHB/AGRON/RURSOC/PHIL 565: The Ethics of Modern Biotechnology
Syllabus, Spring 2013

A. Administrative Information

Instructor: Professor Robert Streiffer
Class: 168 Noland, Monday, 2:25-4:55 (15 minute break at 3:30)
Office Hours: Wednesday, 2:00-3:00 in 1411 Medical Sciences Center and by appointment
Bioethics Office: 1411 Medical Sciences Center; 262-7490
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B. Course Description

This course is for graduate students and upper-level undergraduates. It is an in-depth study of a selection of ethical issues arising from the application of modern biotechnology to microorganisms, plants, non-human animals, and human beings. In contrast to much of the public, academic, and industry discussion on these issues, we will aim at a discussion that is informed both by scientific research and by work done in ethical theory, political philosophy, and other relevant disciplines, and whose character is rigorous, clear, nuanced, and unbiased. I do not consider myself either generally for or generally against biotechnology. As a philosopher, however, I am against bad arguments wherever they are found.

C. Materials:

- The reading packet will be distributed electronically; instructions will be provided in class.
- Handouts and news articles distributed in class
- Because the debate is very polarized, you should be very careful about relying on the web for information about modern biotechnology. While recognizing UW-Madison's own interest in promoting biotechnology, a good places to start is nonetheless http://www.library.wisc.edu/guides/Biology/gmo.htm.

D. Objectives

There are two overall goals of the course:

1. To improve your familiarity with the facts, concepts, theories, and arguments from the relevant scientific, ethical, and political literature.
2. To improve your ability to think about and discuss the ethical issues in this area.

More specifically, I expect you to be able to do the following by the end of the semester:

3. Be more appreciative of opposing viewpoints on controversial ethical questions.
4. Be clearer about your own views on these matters.
5. Define relevant scientific concepts.
6. Define relevant ethical concepts.
7. List the main applications of biotechnology which have raised ethical concerns.

8. Explain how recombinant DNA techniques are used in those applications.
9. List the main ethical arguments for and against each of those applications.
10. Analyze the main arguments from the literature, pro and con, for each of those applications.
11. Assess the reasonableness of the scientific claims made in those arguments.
12. Assess the reasonableness of the ethical claims made in those arguments.
13. Integrate the discussion of science, ethics, and political philosophy to formulate a positive argument for or against applications of biotechnology.

E. Grading Plan:

I use the following grading scale, with your final numerical grade rounded to the nearest letter grade:

Letter Grade	**Numerical Equivalent**
A	4
AB	3.5
B	3
BC	2.5
C	2
D	1
F	0

F. Requirements:

- Before the class for which they are assigned, read all of the assignments, read them carefully, and read them critically. Come to class ready to discuss the material. The contribution that each person makes to the discussion is important.
- Attend all the classes. I will be taking attendance, both to grade attendance and to help me learn your names. Attendance will count as 5% of your final grade. You are entitled to one free unexcused absence. Any excused absences for reasons other than an emergency must be cleared in advance of the class missed. For all excused absences, you must send me an e-mail stating the date and the reason so that I will have a record of it when it comes time to calculate your final grade. Any unexcused absence above your free one will affect your attendance grade as follows:

1 absence	B
2 absences	C
3 absences	D
4 absences	F
5 absences	Fail the class

- Several short, in-class, unannounced quizzes, cumulatively worth 20% of your grade. These will be on the readings assigned for that day, and possibly include short-answer, multiple choice, fill-in-the-blank, and true/false questions. If you have an excused absence, your grade will be computed as if the quiz you missed did not occur. If you have an unexcused absence, you will get a zero for that quiz. No make-up quizzes will be given. The grade for the quizzes

will be determined as follows:
% = total # of correct answers on all the quizzes/total # of questions on all the quizzes ("Select all that apply" questions count as more than one answer);

Grade	A	AB	B	BC	C	D	F
%	100-93	92.9-87	86.9-81	80.9-75	74.9-69	68.9-60	0-59.9

- Undergraduate papers: one shorter paper and two longer papers, per the schedule below.
- Graduate student papers: one shorter paper, and a choice between two longer papers or one term paper in two drafts. By "draft" I mean a draft of a complete paper, not a partial paper. For the two longer papers or the term paper, you may choose your own topic so long as you discuss it with me beforehand.
- Late Paper Policy: You must hand in all the papers in order to pass this course. You may not elect to opt out of a paper and receive an F on it. Papers are due at the beginning of class on the due date. Papers handed in during class but after the beginning of class (= 10 minutes into class) will be bumped to the next letter grade or half-letter grade down (e.g., from an A to an AB, from a C to a D.) After that, the penalty is one full letter grade per 24 hours. Any non-emergency extensions must be requested prior to the due date, and will be granted only in rare circumstances. Although you are encouraged to discuss your papers with friends and classmates, no group work is allowed.
- Incompletes: I think incompletes are almost invariably a bad idea both for the student and the professor, and they will only be granted in rare cases of truly extenuating circumstances. An incomplete will only be granted after the student and I have come to an agreement about when the work for the course will be completed. If the work is not completed by the agreed-upon date, the Incomplete will be changed to an F.
- Sickness as an Excuse: If sickness is used as an excuse for a late assignment, missing a quiz, or having an excused absence, I will need to see a written report from a medical doctor stating your inability to attend class or to complete the assignment.

G. Undergraduate Paper Dates:

	Assigned	Due	Paper Length	Grade
1	Feb. 4	Feb. 11	575-625 words (2 pages)	10%
2	March 4	March 18	1,750-1,850 words (6 pages)	30%
3	April 15	April 29	1,750-1,850 words (6 pages)	35%

H. Graduate Student Paper Dates:

	Assigned	Due	Paper Length	Grade
1	Feb. 4	Feb. 11	575-625 words (2 pages)	10%
2	March 4	March 18	First draft 2,400-3,000 words (8-10 pages); or 2,350-2,450 words (8 pages)	NA/30%
3	April 15	April 29	Final draft 4,675-4,925 words (16 pages); or 2,350-2,450 words (8 pages)	65%/35%

I. Additional Class Policies

Academic misconduct: Please note that the imposition of any penalty for any kind of academic misconduct (e.g., plagiarism, trying to get credit for a class you didn't attend, cheating on an

exam, etc.) results in a permanent note that goes into your academic file, and that UW will disclose the fact that you were penalized for academic misconduct to interested parties who request that information. See http://www.wisc.edu/students/resources/misconduct.htm for UW's policy. Because you are responsible for proper acknowledgement and citation of other people's ideas, even unintentional plagiarism counts as academic misconduct for the purposes of this course.

Classroom Etiquette: You are expected to behave in ways that are appropriate and respectful to the professor and the other students. This includes, but is not limited to

1. Arriving on time. Students who walk into the classroom late create a distraction.
2. Refraining from packing up until class is completely over.
3. Refraining from private conservations with classmates during lecture or discussion.
4. Being patient and courteous to other students when they ask a question or make a comment.
5. Expressing disagreement with the comments of others in a respectful manner.
6. Removing sunglasses and hats.
7. Staying awake.
8. Refraining from reading any non-course-related material.
9. Turn any cell phones off when entering class. (Parents are exempted, but please turn phones to vibrate.)

J. Outside Resources for Help

The Writing Center has several classes and numerous handouts on academic writing. They will also do provide individual writing instruction. Appointments can be made by stopping in at 6171 Helen C. White or calling 263-1992. Their web site is www.wisc.edu/writing. They can be much more effective if you approach them early in the writing process. Strunk and White's classic *Elements of Style* is a good general guide to writing, and Anthony Weston's *Rulebook for Arguments* is a good guide to philosophical writing.

Study Skills: UW, as well as many other universities, have on-line materials available on how to improve your study skills as an undergraduate, and I encourage you to take a look at the URLs below and try to benefit from them.

http://guts.studentorg.wisc.edu/resources_ss.htm?page=resources_ss

Students with disabilities should notify me by the end of the second week of the semester so that appropriate accommodations can be made. Please bring your documentation from the McBurney Center (http://www.mcburney.wisc.edu/).

Jim Pryor has a very helpful page on how to read philosophy papers at

http://www.jimpryor.net/teaching/guidelines/reading.html

Paper Guidance (Modified from Peter Vranas)

EVALUATION DIMENSIONS	ACHIEVEMENT LEVELS		
	UNACCEPTABLE	**AVERAGE**	**PROFICIENT**
1. Organization	a. There is no title or there is a title that does not make clear the topic of the paper (e.g., "Legal murder", when the topic is the death penalty). b. The thesis of the paper is not announced in the introductory paragraphs (i.e., there is no sentence like "I will argue that ..."). c. The paper follows no coherent plan: it reads like a hodgepodge of ideas. The reader wonders how the pieces relate to each other.	a. There is a title that makes clear the topic but not the thesis of the paper (e.g., "The death penalty"). b. The thesis of the paper is announced (e.g., by "I will argue that ...") but is formulated unclearly or vaguely in the introductory paragraphs. c. The paper follows a coherent plan, but the plan could be significantly improved by rearranging certain pieces.	a. There is a title that makes clear the thesis (and thus also the topic) of the paper (e.g., "Against the death penalty"). b. The thesis of the paper is announced (e.g., by "I will argue that ...") and is formulated clearly and precisely in the introductory paragraphs. c. The paper follows a coherent plan with every piece in a proper place. The reader easily sees how the pieces relate to each other.
2. Reasoning	a. The argument contains a fallacy, either a *formal* one (e.g., "*A* entails *B*; so, *B* entails *A*") or an *informal* one (e.g., "everyone accepts *A*; so, *A* is true"). b. The conclusion of the argument is irrelevant to the goal of the argument. (E.g., the argument is advertised as an objection to X, but the conclusion, rather than being that there is a problem with X, is that there is a problem with Y.) c. At least one premise is *irrelevant* to the conclusion.	a. The argument contains no (formal or informal) fallacy but is *inductively weak* (i.e., its premises do not make its conclusion probable, let alone certain). b. The conclusion of the argument is only marginally relevant to the goal of the argument. (E.g., the argument is advertised as an objection to X, but the conclusion is that there is only a trivial problem with X.)	a. The argument is either *deductively valid* (i.e., its premises make its conclusion certain) or *inductively strong* (i.e., its premises make its conclusion probable but not certain). b. The conclusion of the argument is highly relevant to the goal of the argument. (E.g., the argument is advertised as an objection to X, and the conclusion is that there is a serious problem with X.) c. No premise of the argument is irrelevant.
3. Justification	a. The premises of the argument contain major or multiple factual mistakes. b. At least one controversial premise is not supported at all (i.e., it is just stated). ("I feel that ..." does not count as support.) c. The formulation of the argument contains disrespectful (e.g., ridiculing, offensive, or biased) language. d. The reader wonders whether the source of some ideas is you or someone else. (It is *plagiarism* to present ideas that you got from others as if they were your own.)	a. The premises of the argument contain a few minor factual mistakes. b. At least one controversial premise is supported only weakly. c. The argument is respectfully formulated but violates the Principle of Charity (i.e., it gives an unsympathetic reading of others' views). d. The paper makes clear who the source of each idea is but some references are incomplete (e.g., a reference to a journal article includes no page number).	a. The premises of the argument contain no factual mistake. b. Every controversial premise is strongly supported (e.g., by means of a further argument or extensive references). c. The argument is respectfully formulated and gives a sympathetic reading of others' views). d. The paper makes clear who the source of each idea is and gives complete references (including, for a journal article: authors, title, journal, volume, year, and pages).
4. Originality	a. The paper merely recapitulates the material contained in the assigned readings. b. Every argument discussed in the paper is the same as, or is a minor variant of, one of the arguments formulated in the assigned readings.	a. The paper advances beyond the material contained in the assigned readings, but only by drawing on material presented in class. b. Every argument discussed in the paper is the same as, or is a minor variant of, one of the	a. The paper makes a significant advance beyond the material contained in the assigned readings and presented in class. b. The thesis, or at least one argument for or objection to the thesis, differs significantly

		arguments formulated in the assigned readings or in the class discussion.	from every argument formulated in the assigned readings or in the material presented in class.
5. Clarity	a. Even a reader familiar with your sources often wonders what you are trying to say. b. Several moves in the argumentation are not introduced by *transition phrases* (like "One might object to the first premise ...", "I reply that ...", "My second reply to the first objection is ..."). c. There are many (i) excessively long sentences or paragraphs, (ii) undefined obscure terms, or (iii) cases in which you say first something unintelligible and then explain what you meant.	a. Only a reader familiar with your sources almost never wonders what you are trying to say. b. Transition phrases are almost always present but are sometimes *inadequate*; i.e., they do not make clear *who* is making a move (you or an opponent) or *to what* the move responds (e.g., to the first or second premise of an argument). c. There are a few (i) excessively long sentences or paragraphs, (ii) undefined obscure terms, or (iii) cases in which you say first something unintelligible and then explain it.	a. Even a reader unfamiliar with your sources almost never wonders what you are trying to say. b. Almost every move in the argumentation is introduced by a transition phrase that makes clear both *who* is making the move (you or an opponent) and *to what* exactly the move responds. c. There are almost no (i) excessively long sentences or paragraphs, (ii) undefined obscure terms, or (iii) cases in which you say first something unintelligible and then explain.
6. Conciseness	a. The paper is highly repetitive: it makes the same points again and again. b. Many sentences are wordy: the reader finds the writing long-winded. c. There are lengthy or multiple digressions (i.e., passages that can be removed without affecting the argumentation).	a. The paper is slightly repetitive: it makes a few points more than once. b. A few sentences are wordy: their points can be made in significantly fewer words. c. There are a few short digressions (i.e., passages that can be removed without affecting the argumentation).	a. The paper avoids unnecessary repetition: it develops each point only once. b. Almost no sentence is wordy: the reader finds the writing compact. c. There are almost no digressions: almost every sentence contributes to the argumentation.
7A. Precision	a. The reader gets the impression that the writing is sloppy, that you wrote the paper in a hurry or in a single draft. b. The reader can often misinterpret you; your formulations are highly ambiguous (i.e., open to multiple interpretations). c. Your formulations are often highly inexact: what you say is clearly incorrect (e.g., you make category mistakes like saying "this is a false argument").	a. The reader gets the impression that the writing is generally careful but would have considerably improved if you edited more. b. The reader can sometimes misinterpret you; your formulations are slightly ambiguous (i.e., open to a couple of interpretations). c. Your formulations are sometimes slightly inexact: what you say is *strictly speaking* incorrect (e.g., because you use extreme or immodest expressions like "always" or "I will prove").	a. The reader gets the impression that you have carefully thought about almost every single word in the paper, going over multiple drafts. b. The reader can seldom misinterpret you; your formulations are unambiguous (i.e., open to only one interpretation). c. Your formulations are almost always exact: what you say *can* be even strictly speaking correct (although it *might* still be incorrect; e.g., some justified beliefs are false).
7B. Language	a. The style is inappropriate for a scholarly paper: it is too colloquial, too impassioned, too flowery, or too impressionistic. b. There are so many grammatical, syntactic, spelling, or punctuation mistakes that the reader is distracted and has difficulty focusing on the argumentation.	a. The style is scholarly (in general sober and factual) but the paper is dry as a result: the reader feels bored. b. There are some grammatical, syntactic, spelling, or punctuation mistakes, but not so many as to be distracting.	a. The style is scholarly (in general sober and factual) but the paper is still lively: the reader feels interested. b. There are almost no grammatical, syntactic, spelling, or punctuation mistakes.

K. Course Schedule

I. Recombinant DNA Techniques (4 Meetings)

I will go over administrative details, provide an overview of the content and requirements of the course, and provide a brief history of biotechnology. After an introduction to the basics of recombinant DNA technology, we will evaluate some of the ethical arguments people were making in the early 1970s both for and against the use of recombinant DNA techniques. Although rDNA techniques are now known to be quite safe, the arguments are interesting both because they provide a historical context to the current debate, and because many of the current arguments are similar in form to the ones given originally. We will explore such question as the following. Is all genetic engineering unnatural, and if it is, does that make it intrinsically wrong? What does it mean to say that an activity is unnatural, anyway? How should decisions be made under conditions of uncertainty? What grounds the state's right to restrict certain kinds of activities? Is the fact that a group finds a kind of activity offensive a legitimate reason for the state to restrict that activity?

1. Monday, January 28
Course Introduction, Moral Argumentation, and Logic Terminology

2. Monday, February 4
First paper topic handed out
The Basics of Recombinant DNA Techniques; Intrinsic Objections

a. Michael J. Reiss and Roger Straughan, "The Practicalities of Genetic Engineering," Ch. 2 in *Improving Nature?* (Cambridge: Cambridge University Press, 1996), 11-42 (32 pages)
b. Michael J. Reiss and Roger Straughan, "Extrinsic and Intrinsic Concerns," in *Improving Nature?* (Cambridge: Cambridge University Press, 1996), 49-50 (2 pages)
c. Michael J. Reiss and Roger Straughan, "Intrinsic Concerns," in *Improving Nature?* (Cambridge: Cambridge University Press, 1996), 59-64 (7 pages)

3. Monday, February 11
First paper topic due
Extrinsic Objections

a. Paul Berg, D. Baltimore, and H. W. Boyer, "Potential Biohazards of Recombinant DNA Molecules," *Science* 185 (1974), 303 (1 page)
b. Sinsheimer, Robert L., "Two Lectures on Recombinant DNA Research," in *The Recombinant DNA Debate*, ed. by David A. Jackson and Stephen P. Stich (Englewood Cliffs, New Jersey: Prentice-Hall, Inc, 1979), 85-98 (14 pages)
c. Stephen Stich, "The Recombinant DNA Debate: Some Philosophical Considerations," in *The Recombinant DNA Debate*, ed. by David A. Jackson and Stephen P. Stich (Englewood Cliffs, New Jersey: Prentice-Hall, Inc, 1979), 183-201 (19 pages)

4. Monday, February 18
Principles of Legitimate Regulation

a. Joel Feinberg, Selections from "General Introduction," in *Harm to Others*, by Joel Feinberg (New York: Oxford University Press, 1984), 3-27 (13 pages)

b. Joel Feinberg, "The Offense Principle," *in Social and Political Philosophy*, edited by George Sher and Baruch A. Brody (Fort Worth: Harcourt Brace College Publishers, 1996), 84-96 (13 pages)
c. Judith Jarvis Thomson, "Distress and Harm," Ch. 10 in *The Realm of Rights* (Cambridge, Massachusetts: Harvard University Press, 1990), 249-269 (21 pages)

II. Plant Biotechnology (3 Meetings)

In this section, we will explore various theories regarding the duties we have to plants, species, and the environment, we will familiarize ourselves with the current applications and regulations of plant biotechnology, and we will explore views about the role of experts and of public opinion in a democracy. With that framework as background, we will then examine issues regarding environmental risk, labeling, and humanitarian uses of agricultural biotechnology.

5. Monday, February 25
Regulatory Background on Genetically Engineered Crops; Scientific Expertise and Public Preferences in a Democracy

a. Alan McHughen and Stuart Smith, "US Regulatory System for Genetically Modified Crop Cultivars, *Plant Biotechnology Journal* 2008(6), 2-12 (11 pages)
b. U. S. Food and Drug Administration, "Guidance for Industry: Voluntary Labeling Indicating Whether Foods Have or Have Not Been Developed Using Bioengineering," Draft of January 2001 (4 pages)
c. Alan McHughen, "Uninformation and the Choice Paradox," in *Nature Biotechnology* 18 (October 2000) 1018-1019 (2 pages)
d. Robert Streiffer and Alan Rubel, "Democratic Principles and Mandatory Labeling of GE Food," in *Public Affairs Quarterly* Volume 13, Number 3 (2004), 223-248 (26 pages)

6. Monday, March 4
Second Paper Topics Handed Out
The Humanitarian Argument for Agricultural Biotechnology

a. Peter Singer, "Famine, Affluence, and Morality," *in Philosophy and Public Affairs* 1 (Spring 1972), 229-243 (15 pages)
b. Ingo Potrykus, "The 'Golden-Rice' Tale" (16 pages)
c. Greenpeace, "Golden Rice is Fool's Gold," http://www.biotech-info.net/fools_gold.html (1 page)
d. Vandana Shiva, "Genetically Engineered Vitamin 'A' Rice: A Blind Approach to Blindness Prevention," http://www.biotech-info.net/blind_rice.html (4 pages)
e. Martin Enserink, "Tough Lessons from Golden Rice," *Science* 230 (25 April 2008), 468-471 (4 pages)
f. Alexander Stein, H. P. S. Sachdev, and Matin Qaim, "Potential Impact and Cost Effectiveness of Golden Rice," *Nature Biotechnology* 24 (October 2006): 1200-1201 (2 pages)
g. Krawinkel, "What We Know and Don't Know about Golden Rice," *Nature Biotechnology* 25 (June 2007): 623 (1 page)
h. Alexander Stein, H. P. S. Sachdev, and Matin Qaim, "Response to Krawinkel," *Nature Biotechnology* 25 (June 2007): 624 (1 page)

7. Monday, March 11
Environmental Ethics and Genetically Engineered Crops

a. J. Baird Callicott, "The Search for an Environmental Ethic," Ch. 10 in *Matters of Life and Death*, edited by Tom Regan (New York: Random House, 1986), 381-420 (40 pages)
b. Philip Dale, Belinda Clarke, and Eliana Fontes, "Potential for the Environmental Impact of Transgenic Crops," *Nature Biotechnology* 20 (June 2002): 567-574 (8 pages).
c. John Losey, "Transgenic Pollen Harms Monarch Larvae" in *Nature* 399 (20 May 1999), 214 (1 page)
d. Eric Niiler, "GM Corn Poses Little Threat to Monarchs" in *Nature Biotechnology* 17 (December 1999), 1154 (1 page)
e. Carol Yoon, "No Consensus on Effect of Genetically Altered Corn on Butterflies," *New York Times* (4 Nov 1999), A20 (2 pages)
f. Quist and Chapela, "Transgenic DNA Introgressed into Traditional Maize Landraces in Oaxaca, Mexico," *Nature* 414 (29 Nov 2001), 541-543 (3 pages)
g. Paul Gepts, "Introduction of Transgenic crops in Centers of Origin and Domestication," in *Controversies in Science and Technology: From Maize to Menopause* ed. Daniel Kleinman, Abby Kinchy, and Jo Handelsman (Madison, Wisconsin: University of Wisconsin Press, 2005): 119-134 (16 pages)
h. Matthew Metz and Johannes Fütterer, "Suspect Evidence of Transgenic Contamination," *Nature* 116 (11 April 2002), 600-601 (2 pages)
i. Nature, "Editorial Note," *Nature* 116 (11 April 2002), 600 (1 page)
j. Nick Kaplinsky, David Braun, Damon Lisch, Angela Hay, Sarah Hake, and Michael Freeling, "Maize Transgene Results in Mexico are Artefacts," *Nature* 116 (11 April 2002), 600 (1 page)
k. David Quist and Ignacio Chapela, "Quist and Chapela Reply," *Nature* 116 (11 April 2002), 602 (1 page)
l. Kenneth Worthy, Richard Strohman, Paul Billings, and the Berkeley Biotechnology Working Group, "Agricultural Biotechnology Science Compromised: The Case of Quist and Chapela," in *Controversies in Science and Technology: From Maize to Menopause* ed. Daniel Kleinman, Abby Kinchy, and Jo Handelsman (Madison, Wisconsin: University of Wisconsin Press, 2005): 135-149 (15 pages)

III. Animal Biotechnology (3 Meetings)

In this section, we will survey the techniques and uses of animal biotechnology, and evaluate some of the concerns that have been expressed about them. We will look at arguments about the moral status of animals, the ethical justifiability of their use as food or in medical experimentation, the ethical justifiability of using genetic engineering to change an animal's nature to better suit our needs, perhaps at the expense of the animal's own welfare, and at the use of biotechnology to create part animal, part human chimeras.

8. Monday, March 18
Second Paper Topics Due at the Beginning of Class
Uses and Techniques of Animal Biotechnology, Moral Status of Animals

a. John Gluck and Mark Holdsworth, 2008, "FDA Released Draft Guidance on Regulation of Genetically Engineered Animals," *Kennedy Institute of Ethics Journal* 18(4): 392-402 (11 pages)

b. Peter Singer, "All Animals Are Equal," in *Contemporary Moral Problems*, ed. James E. White (Belmont, CA: Wadsworth Publishing Company, 2000), 490-499 (10 pages)
c. Tom Regan, "The Case for Animal Rights," in *Contemporary Moral Problems*, ed. James E. White (Belmont, CA: Wadsworth Publishing Company, 2000), 500-508 (9 pages)
d. Carl Cohen, 1986, "The Case for the Use of Animals in Biomedical Research, *New England Journal of Medicine* 315 (14), 865-870 (6 pages)

Monday, March 25: Spring Break

9. Monday, April 1
Beyond Animal Welfare and Animal Rights

a. David E. Cooper, "Intervention, Humility, and Animal Integrity," Ch. 11 in *Animal Biotechnology and Ethics*, ed. Alan Holland and Andrew Johnson (London: Chapman and Hall, 1998), 145-155 (11 pages)
b. Bernard E. Rollin, "On Telos and Genetic Engineering," Ch. 12 in *Animal Biotechnology and Ethics*, ed. Alan Holland and Andrew Johnson (London: Chapman and Hall, 1998), 156-171 (16 pages)
c. Bernice Bovenkert et al., 2002, "Brave New Birds: The Use of 'Animal Integrity' in Animal Ethics," *The Hastings Center Report* 32 (1), 16-22 (7 pages)

10. Monday, April 8
Human Embryonic Stem Cell Research and Human/Animal Chimeras

a. Jason Robert and Francoise Baylis, 2003, "Crossing Species Boundaries," in *The American Journal of Bioethics* 3 (3) 1-13 (13 pages).
b. Robert Streiffer, 2003, "In Defense of the Moral Relevance of Species Boundaries", in *The American Journal of Bioethics* 3 (3) 37-38 (2 pages)
c. Robert Streiffer, 2005, "At the Edge of Humanity: Human Stem Cells, Chimeras, and Moral Status," *Kennedy Institute of Ethics Journal* 15(4), 347-370 (24 pages)

IV. Human Biotechnology (2 Meetings)

In this section, we will look at the application of biotechnology to human beings. In particular, we will look at human enhancement and human cloning.

11. Monday, April 15
Third Paper Topics Handed Out
Human Enhancement

a. Michael Sandel, "The Case Against Perfection: What's Wrong with Designer Children, Bionic Athletes, and Genetic Engineering," in *Human Enhancement* ed. Julian Savulescu and Nick Bostrom (Oxford: Oxford University Press, 2009), 71-90 (20 pages)
b. Frances Kamm, "What Is and Is Not Wrong with Enhancement," in *Human Enhancement* ed. Julian Savulescu and Nick Bostrom (Oxford: Oxford University Press, 2009), 91-130 (40 pages)

12. Monday, April 22
Human Cloning

a. Leon Kass, 1998, "The Wisdom of Repugnance," *Valparaiso University Law Review* 32(2), 679-705 (27 pages)

b. Bonnie Steinbock, 2006, "Reproductive Cloning: Another Look" *University of Chicago Legal Forum*, 87-111 (25 pages)
c. Tooley, M. (1998) "The Moral Status of the Cloning of Humans", originally in *Human Cloning: Biomedical Ethical Reviews*. Humber and Almeder, eds. Totowa, NJ: Humana Press.

V. Biotechnology, Intellectual Property, and Academic-Industry Relationships (1 Meeting)

In this section, we will look at the patent law system and the main court cases involving biotechnology. We will address such questions as the following. What, if anything, ethically justifies the patent law system? How do academic-industry relationships in biotechnology affect academic freedom? Does allowing life patents encourage harm to the environment or show improper respect for life?

13. Monday, April 29
Third Paper Topics Due at the Beginning of Class
Ethical Evaluation of Patents and Academic-Industry Relationships

a. Ned Hettinger, "Patenting Life," *Environmental Affairs Law Review* 22 (1995): 267-305 (40 pages).
b. Robert Streiffer, "Academic Freedom and Academic-Industry Relationships in Biotechnology," in *The Kennedy Institute of Ethics Journal* 16(2), 129-149 (21 pages)

14. Monday, May 6
Review/Overflow

