

# **Redesigning Life?**

## **FYS 188L, Spring 2007**

**Instructor: Dr. Carrie Johns**

**Office: Memorial Hall 205**

**Hours: M, W, F noon-1 pm**

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**Hours: Monday evening, Tu after seminar**

### **Seminar meeting times and places:**

**Tuesday/Thursday 10:10 – 11:40 Atwood 34**

**Tuesday 2:20 – 3:50 Atwood 34**

### **Seminar Description:**

The development of technologies to decipher, decode, and manipulate genetic materials at the cellular and molecular level have given rise to diverse applications in medicine, agriculture, and clean-up of pollution. This seminar will explore the scientific, ecological, social, and ethical issues surrounding applications of genetic engineering – broadly defined as deliberate human transfer or manipulation of genetic materials amongst organisms either within or between species. We will also dabble a bit in nanotechnology and the possibilities it may bring to society. We will examine applications and impacts of genetic engineering in agriculture, e.g. crops devised with built-in herbicide resistance or which make their own pesticides, use of recombinant bovine growth hormone to increase milk production, crops which produce only sterile seed unless “turned off” by application of specific chemicals. We will also look at possibilities of genetic engineering applied to humans – gene therapy, manipulation of human embryos, gene doping of athletes. What are social and ethical consequences of widespread use of these technologies? Who benefits? Who loses? Who *is* making these decisions? Who *should* be making these decisions? This course is not a “how-to” course in genetic engineering, but rather a “what if?” and “why should?” seminar. Each student will develop her/his own individual research question to investigate through library-based research throughout the semester. We will attend the Festival of Science at the end of the semester so that you may learn what kinds of research senior students are doing and talk with them about their research.

**Course Format:**

Your First Year Seminar is designed to be an interdisciplinary examination of this topic with goals of improving your skills in reading, researching a topic, listening carefully, critical thinking, writing, and speaking. You will have multiple opportunities to read, think, listen and speak for and in class. And, you will research a topic of your choice and develop a sustained argument about that topic in the form of a 10-14 page paper which will include multiple citations and bibliography. We meet Tuesday and Thursday to discuss readings and work together as a group. I will not lecture. Instead, each of you are to come prepared to discuss the reading material (or videos) in depth. Tuesday afternoons will be “research skills” time. Sometimes we will meet in our classroom; sometimes we will meet in the library or a computer lab. You are expected to attend and actively participate in all class meetings. You are responsible for any and all material and assignments due or given for any class you miss.

Class participation counts as a significant fraction of your final course grade so endeavor to speak at least once per class (I will keep track, although it may not be obvious that I am doing so). We want to create a classroom climate which is “free space” for each of us to voice our thoughts on the topic of genetic engineering and related topics without fear of being attacked for our views. So, we must each be responsible for listening carefully and respectfully even if we strongly disagree with certain views being expressed in the room. We should feel free to argue about, to contest, the ideas or evidence being discussed. But, we need to always be mindful of not attacking the person expressing the views.

**Evaluation:**

Class Participation and Discussion	20%
Exam (first)	15%
Mini-Exam (second)	10%
Response papers	10%
Research Project	45% (total)
Research journal	5%
Thesis, Claims, Evidence	5%
Functional Outline	10%
Presentation	5%
Draft paper	required, but not graded
Final Draft	15%
Reflective Essay	5%

Late assignments receive zero credit. *Omission of any portion of the research project will result in failure for the entire project.* For instance, even though the draft paper is not graded, if you do not turn in a draft paper, you will earn a failing grade on the project (45% of grade). The FYS focuses on research as a process, not merely the final product. Thus, if you do not engage the whole process, including revision, you are not satisfying the goals of the course. I take a hard line on this issue because of bitterly disappointing experiences I’ve had in the (recent) past.

### **Required Books Available (or will be) for Purchase at Brewer Bookstore:**

- Ausubel, K (ed) (2004) *Nature's Operating Instructions-The True Biotechnologies* (Washington, D.C.; Sierra Club Books) 236 p.
- Bailey, Britt and Marc Lappe (eds.) (2002). *Engineering the Farm – The Ethical And Social Aspects of Agricultural Biotechnology*. (Washington, D.C.: Island Press).
- Crichton, M. (2003) *Prey* (New York: Avon Books) 528 p.
- Davis, H. (2004) *Rowman and Littlefield Guide to Writing with Sources*. 2<sup>nd</sup> Ed. (New York: Rowman and Littlefield Publishers). (you may already have this)
- Hacker, D. (2004). *A Pocket style Manual*. Fourth Edition. New York: Bedford/St. Martin's. (you probably already have this from fall semester)
- McKibben, B. (2003) *Enough – Staying Human in an Engineered Age*. (New York: Times Books).
- Wilhelm, K. (1976) *Where Late the Sweet Bird Sang*. ( New York: Orb Books). 254p.
- Winston, M. L. (2002) *Travels in the Genetically Modified Zone*. (Cambridge: Harvard University Press).

### **Additional readings:**

- Chang, K. (2005) "Tiny is Beautiful: Translating 'Nano' into Practical" *New York Times* Feb. 22, 2005.
- Choi, C. Q. (2006) "Miniaturized Power" *Scientific American* 294(2): 72-75.
- Cummings, C. H. (2002) "Risking Corn, Risking Culture". *World Watch* 15 (8) Nov/Dec
- Erdely, S. R. (2005) "Wrongful Life?" *New York Times Magazine* Oct. 2005 pp192-199
- Goho, A. (2005) Special Treatment – Tiny Technology tackles mega messes". *Science News* 167: 266-268.
- Katsnelson, A. (2004) Fear of Pharming. *Scientific American* Sept 20, 2004.
- Lanza, R. and Rosenthal, N. (2004) The Stem Cell Challenge. *Scientific American* May/June 2004 Vol. 290 (6): p92-99
- Shand, H. and K.J. Wetter (2006) "Shrinking Science: an introduction to nanotechnology" In: *State of the World 2006* (New York; W. W. Norton) pp. 78-95.
- Stix, G. (2006) "Owning the stuff of Life" *Scientific American* 294(2): 76-83.
- Sweeney, H.L. (2004) Gene Doping *Scientific American* [www.sciam.com](http://www.sciam.com) accessed Dec. 3, 2004.
- Tauli-Coruz, V. (2001) "Biotechnology and Indigenous Peoples" in *Re-Designing Life?* B. Tokar (ed) (New York, Zed Books) pp.252-270.

# Class Schedule

## Week 1

Jan. 23 (Tu) Introductions – no reading  
The Research Notebook and using Odysseus

Jan. 23 (Tu) Genetic Engineering and Human-ness  
Read; McKibben *Enough* Chpt 1

Jan. 25 (Th) Nano-Engineering and Humaness  
Read: Mckibben *Enough* Chpt 2  
Response paper due in class

## Week2

Jan. 30 (Tu) Should We Live Forever? Should We Design Our Kids?  
Read in *Enough* Chpt 3; “Wrongful Life?” article

Jan.30 (Tu) Sources in the Mainstream and Alternative Presses

Feb. 1 (Th) Can We Just Say No?  
Read *Enough* Chpts. 4 & 5  
Response paper due in class

## Week 3

Feb. 6 (Tu) Is it Cheating? The potential use of genetic engineering in athletes  
Read: Sweeney’s “Gene Doping”  
Article on recent Tour de France

Feb. 6 (Tu) Choosing a Research Topic and Developing a Research  
Question

Feb. 8 (Th) Genetic Engineering in Agriculture  
Read: *Travels in the Genetically Modified Zone*  
Chpts 1-3.  
Response paper due in class

## Week 4

Feb. 13 (Tu) Genetic Engineering in Agriculture  
Read: *Travels in the GM Zone* Chpts 4-7

Feb. 13 (Tu) Peer-Review Process and Finding Journal articles with  
Indexes and databases

Feb. 15 (Th) Genetic Engineering in Agriculture  
Read: *Travels in the GM Zone* Chpts 8 – end  
Response paper due in class  
Begin viewing of *Harvest of Fear* in class  
**DUE Friday: 1-2 page description of your research topic**

### Week 5

- Feb. 20 (Tu) Genetic Engineering in Agriculture  
Continue in class viewing and discussion of  
*Harvest of Fear* (video)
- Feb. 20 (Tu) Web sources – how to evaluate their credibility  
Work on finding sources for research papers
- Feb. 22 (Th) Pros and Cons of GE Crops and Animals  
Read: “Risking Corn, Risking Culture”  
“Fear of Bio-pharming”  
Response paper due in class

### Week 6

- Feb. 27 (Tu) **Essay Exam in class** – through Feb 22nd
- Feb. 27 (Tu) Thesis, Claims, and Evidence – what are they?  
How should you use them effectively?  
Bring Davis booklet “Writing with Sources”
- Mar. 1 (Th) Introduction to nano-tech  
Read: “Shrinking Science” by Shand and Wetter

### Week 7

- Mar. 6 (Tu) Examples of Nanotech in Use  
Read: Chang “Tiny is Beautiful”, Goho “Tiny technology  
Tackles mega messes”, Choi “Minaturized Power”
- Mar. 6 (Tu) Ethical Use of Source Materials; Academic Integrity  
BRING: Davis “Writing with Sources”
- Mar. 8 (Th) Nature’s Biotechnology  
Read in *Nature’s Operating Instructions* pp 3-105  
**DUE FRIDAY: Annotated bibliography and thesis**

### Week 8

- Mar. 13 (Tu) Nature’s Biotechnology continued  
Read in *Nature’s Operating Instructions* pp 106-196
- Mar. 13 (Tu) Structuring your research paper &  
Developing the Functional Outline  
(review of annotated bibliographies)
- Mar. 15 (Th) Who owns our genes? Should they?  
Read: Stix “Owning the Stuff of Life” and  
Tauli-Corpuz “Biotechnology and Indigenous Peoples”

\*\*\*\*\*Semester Break\*\*\*\*\*

### Week 9

- Mar. 27 (Tu) Critics of GE continued  
Read in *Engineering the Farm*\_Chpts 1-4

Discussion with Genetically Modified Snacks

Mar. 27 (Tu) Workshop on developing the Functional Outline

Mar. 29 (Th) Critics of GE in Agriculture  
Read in *Engineering the Farm* Chpts 5-10

**DUE FRIDAY: Your Functional Outline by noon – email ok.**

**Week 10**

Apr. 3 (Tu) Stem Cell Research – and the pressure to succeed in research  
Read: “The Stem Cell Challenge” and articles from the  
New York Times on fraudulent stem cell research

Apr. 3 (Tu) In Library – Finding more sources

Apr. 5 (Th) **Mini-Exam in class**

**Week 11**

Apr. 10 (Tu) Student led Discussion of *Prey*  
Read up *to* “Day 6, 11:42 a.m.” (first 252 p)  
**DO NOT READ FURTHER!!! SERIOUSLY!!! STOP!!!!**

Apr. 10 (Tu) Revision as Process

Apr. 12 (Th) Student led discussion of *Prey*  
Finish book for class

**Week 12**

Apr. 17 (Tu) Student led discussion of *Where Late the Sweet Birds Sang*  
Read the whole book

Apr. 17 (Tu) Preparation for Student research presentations

Apr. 19 (Th) Consultations on Draft Papers  
**DUE FRIDAY by 2 p.m. DRAFT Research Paper in hard copy**

**Week 13**

Apr. 24(Tu) Student research presentations

Apr. 24 (Tu) Student research presentations

\*\*\*\*\*Students are to attend The Festival of Science\*\*\*\*\*

Apr. 26 (Th) Student research presentations

## **Week 14**

May 1 (Tu) Writing Conferences for Final Drafts

May 1 (Tu) Writing Conferences for Final Drafts  
Course Evaluations in seminar

May 3 (Th) Writing Conferences for Final Drafts  
**DUE FRIDAY:** Response summaries to 3 FOS presentations

**Finals Week:** Final draft of Research Paper with research journal (including final reflective essay) due at 4:00 p.m. on **Tuesday May 8th**

### **Some Suggestions for Research topics/questions:**

The “Escape” of genes from GM O maize into traditional races of maize in Mexico – so what? How much? What now?

Will extensive and prolonged use of GM crops result in “super weeds” or super pests”? “Biosafety” protocol (Cartagena Protocol) – what is it? Is it enough?

Past and potential use of “Gene doping” in athletics, e.g. baseball, bike races, etc??

Production of medicines in plants or animals – what, how, why, and is it a good idea?

Why has the European public resisted GE foods? Why the moratorium on GMOs in Europe by the EU until very, very recently and why the change to allow some?

Has Bovine Growth Hormone use been a boon or bane to dairy industry? Why did the U.S. ok its use, but Canada did forbid it?

What’re the potential benefits/drawbacks of gene therapy? Pick something specific

How will organic farmers be affected by nearby use of GM crops?

Should genetically modified ingredients be allowed in foods labelled “organic”?

Does U.S. policy on planting refugia sufficiently protect ecosystems from gene flow or Development of pest/weed resistance to pesticides?

Are GE crops needed to “feed the world”? Specifically, what about “Golden Rice”?

Should parents be able to “design” their babies before they’re born? If so, for what characteristics? Look into Pre-implantation diagnostic screening.

Are Bt modified crops the ecological downfall of Monarch butterflies or other species?

What is “terminator technology”? How does it work? What are its implications?

Where and why have grass-roots groups formed to resist certain aspects of genetic engineering? What forms has social resistance taken and to what effect?

Is the U.S. (or the E.U. or Canadian) policy on testing GMOs before commercial use sufficient to protect the public and/or ecosystems? Why or why not?

Is the use of genetic engineering in, or as, art an appropriate use of biotechnology?

Does patenting of genes deter medical screening or medical research?

Should foods containing GE ingredients be labelled? Why or why not?

Should genes, or even fragments of DNA, be patentable? Why or why not?

## **FYS Seminar: ReDesigning Life?**

### **Research Journal**

Throughout the course, you will keep a journal of your research activities. It will include the research assignments you complete as part of our research skills sessions, your notes on sources, and all drafts and components of your research project. For this you should get and dedicate to this purpose either an entire “accordian” folder or a large 3 ring notebook with paper and sub-folders. Please keep this folder or notebook solely for your FYS research project/paper. In addition to submitting this at the end of the semester with your final draft of your paper, I may ask to see it at different times during the semester (unannounced) in order to see how you are doing and make suggestions so keep it organized and up-to-date. The form of organization of the journal is up to you – whatever you think will work best for you.

In addition to assigned pieces of work, you should also make a complete record of your research activities for the research paper. In your research you will need to read widely in relevant scholarly literature. Your journal should include your database searches, notes on the sources you consider and discard, as well as those you utilize more fully.

Additionally, the journal should include copies of the articles that you find and use to any extent. I also encourage you to describe and reflect on the various research strategies you employ, not only those that are successful but also those that are unsuccessful. What directions or aspects did you find to be useful? Which aspects appear less useful? Why?

The journal will be a record to aid you in the complex task of developing a research paper, and it will also show me the effort you put into the research component of this course, instead of just the fruits of that effort. It should also serve for you as a reminder of research strategies, and a chance to discover what methods work best for you.

Remember, a significant goal of the project is to develop more experience and skill at undertaking research. This process is important in learning, or refining, skills which you will need in upper level courses, regardless of your eventual major. All fields of study involve an understanding of and ability to do a literature search in order for you to acknowledge and build upon what other scholars and researchers have done before you.

### **Research paper**

The research paper itself will be developed through and evaluated at several different stages. The functional outline will lay out the paper’s structural logic, advancing the thesis and illustrating how its claims will be developed in the paper, including what evidence will be used to support each component of the argument. The full draft should be a well-written, carefully crafted, reasonably polished, and proofread paper (10-15 pages). It should read as if it were a completed paper. The final draft will involve reworking the early draft to address any weaknesses in the thesis, claims, evidence, or style, and developing certain ideas further. You may also need to find further information through research materials from the library. Your grade for the final draft will reflect the extent and quality of your revision and deepening of your analysis and argument.

## First-Year Program Philosophy and Goals 2006-07

The First-Year Program (FYP) and First-Year Seminar (FYS) are the first steps in a four-year process of helping you meet the University's Aims and Objectives and the broader goals of a liberal education. The faculty of the FYP and FYS see themselves as partners and mentors in the process of working with you to acquire the intellectual habits of mind, the writing, speaking, and research skills, and the ethical self-reflexiveness that are at the core of a liberal education. The FYP and FYS will ask you to consider new perspectives on the world and your place in it and will challenge you to confront many of the hidden assumptions you bring to college with you. We hope to open you to new ideas, help you to see the complexity of the way in which knowledge gets produced and used in society, and encourage you to see yourself as an active contributor in making the world a better place. The course topics, the texts you will read, listen to, and watch, the in-class and out-of-class activities you will engage in, and the writing, speaking, and research assignments you will work on are all designed to introduce you to the depth of critical thinking and the quality and complexity of the communication skills that will be expected of you at SLU and as a citizen of an increasingly diverse society.

First and foremost among our goals are those related to your abilities as a communicator. The work of the FYP and FYS asks you to design and deliver written, spoken, performed and/or visual texts that demonstrate basic skills in the relevant modes of communication and with an increasing degree of rhetorical sensitivity. Our focus on "rhetorical sensitivity" means that we expect you to cultivate the awareness that all of your communication, whether formal or informal, involves having to make choices about your messages, whether written, spoken, aural or visual. To become a good communicator, you need to recognize that the creation of meaningful and powerful written, spoken, performed, or visual texts involves both a creator and an audience, and that therefore the voice you adopt in your communication, the audience you imagine yourself communicating to, and the social and ethical context of the content, matter a great deal in creating such texts. One important way to become a better communicator is to become a better critical reader, viewer, and listener, which is why we will ask you to engage challenging materials in a variety of forms and work with you to learn how to interpret them.

Learning to read, listen, write, speak, do research and/or perform well also requires feedback. As faculty, we submit our work for feedback from colleagues all the time, and giving and receiving constructive feedback from both friends and strangers is central to collaborative work in any field and is itself a form of critical thinking and learning. We further recognize that this feedback process is not linear and that good communication requires that you continually rethink, restructure, and revise your work in order for it to be your best. This is why we require that your writing, speaking, and performance assignments be "projects" that include preparatory exercises and multiple drafts or rehearsals, all of which ask you to continue to reflect critically on the choices you have made in the texts that you produce. Furthermore, we see all of these forms of communication as complementary and intertwined, which is why many of your assignments will ask you to integrate elements of the written, spoken, performed, and visual. Finally, developing good habits of critical inquiry and communication also means reflecting on the ethical dimensions of how your work represents that of others, thus one of our goals is to help you to understand both the nature of academic integrity and the social processes by which knowledge is produced and represented.

To ensure that the program is meeting its stated goals, all FYP and FYS syllabi are read by other faculty in the program to determine if they include a variety of assignments that foster the writing, speaking, research, and critical thinking goals of the program. All FYP and FYS courses have to be approved by faculty in the program before they are offered.

## First-Year Seminar research project learning goals

With respect to research skills specifically, our learning goals for the spring are that students should:

- Be introduced to ways of conducting productive and imaginative inquiry and research in order to become a part of the various conversations surrounding issues.
- Learn to differentiate among the various ways that information is produced and presented, between popular and scholarly journals and books, between mainstream and alternative publications, between primary and secondary sources.
- Learn how to evaluate and synthesize information, whether gathered from traditional sources, such as books and journals, or from websites or electronic media.
- Begin to develop the skills of critical analysis in the interpretation and use of information gathered from any source.
- Be introduced to the ethical obligations that scholars have to both responsibly represent their sources and inform their readers of the sources of their information, as well as learning, and being held responsible for the proper use of, the conventions of scholarly citation and attribution.
- Present the results of your research through writing, speaking, visual elements, or other multimedia forms in such a way that you demonstrate the ability to communicate effectively using the rhetorical conventions of the chosen form.