

Syllabus: Biotechnology: Science and Ethical Issues 304 (MWF, 11:30-12:20, in KUY 306)

Instructor: Dr. David Christopher
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Text books:

1. Introduction to Biotechnology, William Thieman and Michael Palladino
2. Jonathan Livingston Seagull, Richard Bach

Selected handouts: The most prominent hand-out is a pdf copy of five chapters from “A companion to Genethics”, Justine Burley and John Harris (eds). In addition, other handouts from the news and magazines will be given. All are required reading.

Contemporary Ethical Issues Course Goals:

The purposes of this course are fivefold: (1) To increase your basic knowledge of the scientific facts and concepts of biotechnology; (2) To enhance your awareness of the socio-ethical impacts of biotechnology on society and how it is changing our world and lives; (3) To explore and discuss the ethical issues, frontiers and controversies arising from the science; (4) To increase your ability to think outside the box about the ethical impacts of biotechnology; (5) To discuss biotechnology using facts to make responsible decisions about ethical controversies.

In a media dominated world of sound bites and bullet statements, the scientific truth is often distorted. Myths and empty issues are created, while the real issues are unaddressed or become veiled. This course will help you separate biotechnological fact from fiction. Half of the material will cover the science and half will deal with socio-ethical issues. You will develop biotechnology literacy, focusing on real concepts and tune in to the current ethical issues, values and emotional reasoning that arise from the biotechnology revolution.

Student Commitment:

To truly examine these issues and discover the impacts, you must be familiar with the underlying scientific concepts. By enrolling in this course you are making a commitment to attend class, learn the material in lectures and textbooks, actively participate in class and assignments, and complete all assignments by the designated deadlines.. Your success depends on your willingness to take ownership of your learning. The final exam is done as a team comprised of a sub-group of your classmates. You are expected to thoroughly engage in the group process and analysis.

Students are encouraged to contact the instructor in regard to any aspect of the course. Each student is expected to attend all meetings of this class. Absence from classes may adversely impact the course grade. Students are not excused from the exams without a letter from their doctor.

Syllabus: Biotechnology: Science and Ethical Issues 304**Course Schedule**

1. Aug. 25 Assignments & syllabus. Overview History of biotechnology.
2. Aug. 27 Examples of biotechnology, perspective on associated ethical issues.
3. Aug. 29 Introduction to cell structure, genes and decoding genes
4. Sept. 3 More on decoding genes and start recombinant DNA technology
5. Sept. 5 Recombinant DNA technology: Recombinant human insulin
6. Sept. 8 Do genes have moral status? genetic trespassing?
7. Sept. 10 Animal and human cloning, science.
8. Sept. 12 Animal and human cloning: ethical issues and impacts part A
9. Sept. 15 Animal and human cloning: ethical issues and impacts part B
10. Sept. 17 Genetic engineering animals, science and applications
11. Sept. 19 Ethical issues related to transgenic animals.
12. Sept. 22 Human embryonic stem cells, applications and ethics, life begin?
13. Sept. 24 Molecular Diagnostics, DNA fingerprinting, Part A
14. Sept. 26 Molecular Diagnostics, PCR, PIGD Part B.
15. Sept. 29 Genetically Correct: Ensuring perfect babies, science & ethics
16. Oct. 1 In-class discussion, ethics of embryo selection. Who is right?
17. Oct. 3 Rights, Responsibilities, Privacy, Control of Genetic Info. **(JLS Due)**
18. Oct. 6 Humanist Ethical Relativism, Harold & Maude case study part A
19. Oct. 8 Humanist Ethical Relativism, Harold & Maude case study part B
20. Oct. 10 In class discussion: Humanist Ethical Relativism.
- 21. Oct. 13 Exam I**
22. Oct. 15 Human genetic diseases, human genome project
23. Oct. 17 Human genome project, case studies ethical impacts
24. Oct. 20 Human gene therapy, applications
25. Oct. 22 In class discussion, ethics and value of genetic identity
26. Oct. 24 Human gene therapy, case studies, ethical impacts
27. Oct. 27 Marine biotechnology, Supersalmon: science and ethics
28. Oct. 29 Plant biotechnology, papaya virus resistance, GE vs. breeding.
29. Oct. 31 Ethics and impacts of virus-resistant crops.

- 30. Nov. 3 Plant biotechnology case study: Herbicide resistance
- 31. Nov. 5 Socio-ethical impacts, herbicide resistant crops
- 32. Nov. 7 Plant biotechnology case study, Bt crops Benefits
- 33. Nov. 10 Ethics and Impacts of Bt crops. Starlink corn
- 34. Nov. 12 Golden rice, "Flavr Savr" tomatoes, pollen containment
- 35. Nov. 14 Reaction of society to GMO crops I video case study
- 36. Nov. 17 Reaction of society to GMO crops II video case study
- 37. Nov. 19 The GMO Taro both sides of the debate
- 38. Nov. 21 In-class discussion: GMO Taro debate: Label GMO foods?
- 39. Nov. 24 Exam II**
- 40. Nov. 26 *No biotech class – Finish Work on Impact Paper*
- 41. Dec. 1 Patenting living cells, genes, controversies. **(Impact paper due)**
- 42. Dec. 3 Bioengineered microorganisms, applications, ethics
- 43. Dec. 5 Vaccines and vaccination: science and ethics
- 44. Dec. 8 Bioterrorism: anthrax etc ethical issues and concerns.**
- Dec. 10 **Review and Hand out FINAL EXAM;** (graded impact papers returned)

Grading: % points indicate portion of each assignment counting to final grade, 100%.

1. Final Exam, Take home (20%). Due date is specified on the exam.
2. Impact Paper on Current Socio-ethical Issues (20%) Due Dec. 1.
3. Two in-class exams (15% each).
4. Jonathan Livingston Seagull Written Analysis (20%) Due Oct. 3.
5. In-Class Group Discussion Answers (10%)