SC/BIOL 4305 3.00 Controversies in the Modern Life Sciences  
Fall 2020

Course Description

This course is designed to give students the skills to analyze controversies within the bio-medical sciences and at the interface of the life sciences and society. Emphasis is placed on study of the methods, theory, socio-political and ethical issues in contemporary life sciences. Students will become practiced in library searches, critical reading and writing, PowerPoint presentations, and in working in groups.

Prerequisites


Course Instructors and Contact Information

Professor Jan Sapp  
Email: biol4305@yorku.ca  
Office: Farquharson 306.

Schedule

Class time: Tuesdays: 1430-1730  
Location: delivered remotely on zoom for live stream lectures. Students will require a computer and internet service. Lectures will also be recorded.

• For outside class time questions, I will provide “office hours” after class. You may also contact me at biol4305@yorku.ca.
Evaluation

Midterm test (Oct 27) 25% on the lectures and text, Jan Sapp, *What is Natural? Coral Reef Crisis*. New York; Oxford University Press, 2003. The mid term test may be conducted with the aid of an online proctoring service. All students must write the test on October 27.

Essay proposals 15%: due Oct 6, introducing the topic and its significance and what you will do in the essay, one page, plus a bibliography indicating the literature you intend to study. To be submitted through turnitin on the e-class site for the course.

Student presentations (20%). Students will give 10 minute PowerPoint presentations of their individual work. Each student will be assessed only on their own presentation and lead class discussion. Students will work in groups on an over arching topic and will be responsible for coordinating their individual projects such that they are partitioned so as to form a coherent series, with little overlap.

Class participation: All students will offer written evaluations of all talks on the evaluation form provided for downloading from the e-class site. Note up to 10% of final mark will be deducted for lack of class attendance and participation; 10% off for three classes missed.

Essays: 40% due Dec 11, 8 pages, double-spaced, 12 pt font (2000 words), plus references with scholarly formatting (e.g. as per *What is Natural?*). NOTE: At least 7 journal articles and/or scholarly books must be used and properly referenced in the essay. Your aim to write an historical narrative required, Tell a story, not a textbook or Wikipedia entry: What? Where? When? Who? Why? How?. Avoid passive tense such as “it was found” etc. Who reported something: When? Where? Why? Based on what data? Final essays will be submitted through turnitin on the e-class site for the course.

Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.
Important Dates

First class: September 15  
Final day of Class December 8  
Research proposals due: Oct 6  
Mid term test: October 27  
Reading week: October 10-16  
Final term paper due: December 11

Resources

**Course Moodle:** My PowerPoint slides will be made available to the class through the course Moodle site. These slides are not a substitute for attending class or reading the book. You are responsible for information you may have missed in the lectures.

Learning Outcomes

Students are introduced to social and political issues often underlying biological controversies and begin to understand processes by which controversies may open and close. Students become practiced in literature searches, critical reading and writing, PowerPoint presentations, working independently and in groups.
Course Content

September 15 Introduction, methods for writing a term paper for this course, topics and forming groups.

September 22 What is Natural? P. xi-49
September 29 What is Natural? 49-115
October 6 What is Natural? 115-163
October 10-16 Reading week

October 20 What is Natural? 163-216

October 27 Test

November 3 Workshop
November 10 Student Presentations
November 17 Student Presentations
November 24 Student Presentations
December 1 Student Presentations
December 8 Student Presentations

Course Policies

Missed mid-term Test: If you miss a test with a legitimate documented reason, permission may be granted to take a makeup test. Makeup tests may be conducted orally over zoom. Remember a computer internet connection is a requirement of this course. If your internet happens to fail the hour of the test, tethering a cell phone should work.

Assignment and midterm dates are non-negotiable. They have been structured to distribute your workload over the term. There are no alternative assignments that can be completed for you to increase your mark, and the value of any missed assignment cannot be transferred to another.
20% of the value will be deducted for any assignment not completed on the due date.

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Student’s in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.
Additional information is available at the following websites:
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Suggested Essay Topics

Your aim to write an historical narrative required, Tell a story not a textbook or Wikipedia entry: What? Where? When? Who? Why? How?. Avoid passive tense such as “it was found” etc. Who reported something: When? Where? Why? Based on what data?

1. THE HUMAN GENOME PROJECT
Student 1 when did it begin? What where when why?
Student 2 Aims and claims
Student 3 Ethical issues raised

History, ethical, legal, and social issues. See also various books on the human genome project

2. GENE PATENTING
When did gene patenting begin?
What genes are patented? Where, who?
Ethics and regulations?
<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Journal/Media</th>
<th>Volume/Issue/Part</th>
<th>Pages</th>
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</thead>
<tbody>
<tr>
<td>Kluge</td>
<td>&quot;Patenting human genes: When economic interests trump logic and ethics&quot;</td>
<td>Health Care Analysis</td>
<td>11, no. 2</td>
<td>119-130</td>
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<tr>
<td>Pompidou</td>
<td>&quot;Research on the Human Genome and Patentability - the Ethical Consequences&quot;</td>
<td>Journal of medical ethics</td>
<td>21, no. 2</td>
<td>69-71</td>
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<tr>
<td>Warner</td>
<td>&quot;Are life patents ethical? Conflict between catholic social teaching and agricultural biotechnology's patent regime&quot;</td>
<td>Journal of Agricultural &amp; Environmental Ethics</td>
<td>14, no. 3</td>
<td>301-319</td>
</tr>
<tr>
<td>Billings</td>
<td>&quot;Ethics and gene therapy&quot;</td>
<td>Journal of Gene Medicine</td>
<td>5, no. 3</td>
<td>S3-S3</td>
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<tr>
<td>Chan &amp; Harris</td>
<td>&quot;The ethics of gene therapy&quot;</td>
<td>Current opinion in molecular therapeutics</td>
<td>8, no. 5</td>
<td>377-383</td>
</tr>
<tr>
<td>Coutelle &amp; Rodeck</td>
<td>&quot;On the scientific and ethical issues of fetal somatic gene therapy&quot;</td>
<td>Gene therapy</td>
<td>9, no. 11</td>
<td>670-673</td>
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<tr>
<td>Dawson et al.</td>
<td>&quot;Safety issues in cell-based intervention trials&quot;</td>
<td>Fertility and sterility</td>
<td>80, no. 5</td>
<td>1077-1085</td>
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<tr>
<td>Evans &amp; Zanjani</td>
<td>&quot;The ethics of gene therapy and abortion: Public opinion&quot;</td>
<td>Fetal diagnosis and therapy</td>
<td>20, no. 3</td>
<td>223-234</td>
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<td>Foddy</td>
<td>&quot;The ethics of genetic testing in sport&quot;</td>
<td>International Sportmed Journal</td>
<td>7, no. 3</td>
<td>216-224</td>
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<tr>
<td>Jaffe et al.</td>
<td>&quot;Gene therapy for children with cystic fibrosis - who has the right to choose?&quot;</td>
<td>Journal of medical ethics</td>
<td>32, no. 6</td>
<td>361-364</td>
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<tr>
<td>Kimmelman</td>
<td>&quot;Recent developments in gene transfer: risk and ethics&quot;</td>
<td>British medical journal</td>
<td>330, no. 7482</td>
<td>79-82</td>
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<td>Lippe &amp; Rasmussen</td>
<td>&quot;Gene therapy and ethics&quot;</td>
<td>Journal of medical ethics</td>
<td>28, no. 1</td>
<td>58-58</td>
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<td>Modell</td>
<td>&quot;Approaching religious guidelines for chimera policymaking&quot;</td>
<td>Zygon</td>
<td>42, no. 3</td>
<td>629-641</td>
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<td>Rabino</td>
<td>&quot;Gene therapy: Ethical issues&quot;</td>
<td>Theoretical medicine and bioethics</td>
<td>24, no. 1</td>
<td>31-58</td>
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<tr>
<td>Billings</td>
<td>&quot;Ethics and gene therapy&quot;</td>
<td>Journal of Gene Medicine</td>
<td>5, no. 3</td>
<td>S3-S3</td>
</tr>
<tr>
<td>Scully et al.</td>
<td>&quot;Non-professionals' evaluations of gene therapy ethics&quot;</td>
<td>Social science &amp; medicine</td>
<td>58, no. 7</td>
<td>1415-1425</td>
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<tr>
<td>Simon</td>
<td>&quot;Human gene therapy: Genes without frontiers?&quot;</td>
<td>American Biology Teacher</td>
<td>64, no. 4</td>
<td>264-270</td>
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<tr>
<td>Spink &amp; Geddes</td>
<td>&quot;Gene Therapy Progress and Prospects: Bringing gene therapy into medical practice: the evolution of international ethics and the regulatory environment&quot;</td>
<td>Gene therapy</td>
<td>11, no. 22</td>
<td>1611-1616</td>
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<tr>
<td>Swazo</td>
<td>&quot;Calculating risk&quot;</td>
<td>Journal of Medicine and Philosophy</td>
<td>31</td>
<td>533-564</td>
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</tbody>
</table>
4. GENETIC SCREENING

A. Ethical issues and regulations in medicine, health and Insurance?
B. Social control and policing- China
C. 23 and me and Ancestry.com


Briard, M.L. 2002, "Genetic screening in children.", *Archives De Pediatrie*, vol. 9, pp. 3S-7S.


5. TRANSGENIC ORGANISMS

a. The Recombinant DNA Controversy

Student 1 What started it? When how, who what where? (W5)
Student 2 What was the controversy about, what arguments made for and against it. Who
Student 3 What was policies came out of it- e.g. NIH guidelines? What occurred later with biomedical applications.


See, for example, Raymond A. Zilinskas and Burke K. Zimmerman eds., *Gene-Splicing Wars: Reflections On the Recombinant DNA Controversy* New York: Macmillan Publishing Company, 1986


B. GMOs in agricultural production. The Monsanto controversy


C.GMOs labelling controversy


6. STEM CELL RESEARCH

Student 1 How did stem cell research originate W5?

Student 2 Aims and promises

Student 3 Regulations : what, when, where, why, how?


7. CRISPR technology.
Student 1 What is it? How was it discovered? W5
Student 2 What does it promise? How has it developed since its discovery?
Student 3 Controversy over patents

8. The EVOLUTION-CREATIONISM DEBATE
1. When and where did the Creationism movement against evolutionary biology begin?
   Who are they? What religious groups?
2. What do they argue, and on what basis? What do they aim for? What do they hope to achieve? What is intelligent Design? When and where did it originate? Who what where when?
3. How do evolutionists respond? Who what when?

9. ON HUMAN ORIGINS

1. Multiregional versus “Out of AFRICA,” theories  
2. Hybridization theories etc.

E. Aguirre, “Early human expansions into Eurasia: The Atapuerca evidence
10. THE SOCIOBIOLOGY DEBATE

Who what when where?
A. What is sociobiology? What are its aims and claims?
How does it relate to social Darwinism?
What are the arguments that sociobiologists make about the genetics and evolution of human behavior and culture?
2. What arguments do critics make? Who, what, when, where?
3. How do sociobiologists respond to critics. What is evolutionary psychology? Who what when where?


11. GLOBAL WARMING AND CLIMATE CHANGE

A. What is the greenhouse effect? When was it coined how did the concept evolve and based on what evidence?. Who what where when?
B. When did evidence of global warming begin, what is the evidence, how was it gained? Who what where when?
C What arguments do opponents provide against it? Who what when where?
12. What are the so-called 5 Mass Extinctions?
A. Who named them as such, when why?
What caused them?

B. The 6th mass extinction? Holocene or anthropocene?

13 What led to the extinction of the megafauna 10,000 years ago?

A. Anthropogenic
B. Natural.


14. What led to the extinction of the Neanderthals?

A. Who were the Neanderthals? Changing data and theories.
B. What was the relationship of Neanderthals to humans


Kuhn, Steven L.; Stiner, Mary C. "What's a Mother to Do? The Division of Labor among Neandertals and Modern Humans in Eurasia". *Current Anthropology.* 47: 953–981.

Kuhn, Steven L.; Stiner, Mary C. "What's a Mother to Do? The Division of Labor among Neandertals and Modern Humans in Eurasia". *Current Anthropology.* 47: 953–981.


15 Life on other planets:
A. Panspermia hypotheses? Who what where why when?


B. Controversies over risk in planetary exploration of space exploration

C.Evidence today for cosmic evolution in interstellar space

D. Search for Life on Mars?
When did it begin? How as it investigated? What institutions and leading scientists involved
What were the arguments against the search for extra-terrestrials life
Evidence today


16. Emerging Infectious Disease

1. What caused the influenza Pandemic of 1918? What research is done on it, what evidence? What remains debated?
2. Why were there warnings about plagues to come 50 years ago?
Richard Preston, The Hot Zone, 1994


3. HIV. Theories on the origin


17. Covid-19
A. Origin,
Market or Biowarfare laboratory leak?

B. How and when were governments notified? How did they take action? The Role of the WHO

C. Vaccine research
D. Hydroxychloroquine

E. T cells versus antibodies

18. Vaccination controversies:
A. History of vaccination: who invented it, when where and how?
B. Use and legislation by governments. What when where why?
C. How did the anti-vaccination movements begin. Origins and ideology. Reasoning, and response


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