ANT 4930 (Sections 324C and 4226) Bioethics in Daily Life

Prof. Connie J. Mulligan

Class meets in 415 Black Hall
Class time: Tuesday, period 6 (12:50-1:40 pm) and Thursday, periods 5-6 (11:45-1:40 pm)
Office hours: Tuesday, 11:30-12:30 pm, 409 Genetics Institute (or by appointment)

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Course summary: Bioethics in Daily Life is intended to introduce students to bioethical issues that are encountered in everyday life through the popular media. This course will provide students with an understanding of the scientific basis of these issues in order to develop informed opinions. 1) For instance, what are the issues with genetic testing and 'designer babies'? Do we understand the human genome sufficiently to choose particular genes and traits for the next generation? Should this technology be available to whoever can afford it? Scientific advances, such as CRISPR/Cas9, now provide the means to modify the genome with a high level of precision so these questions will become more and more relevant. 2) Another issue is animal experimentation. Do the many medical advances based on animal experimentation justify such use of animals? What do we understand about animal cognition and how does such information influence our opinion on animal experimentation? 3) What about artificial intelligence? Can we go too far with this technology? What does it mean to be human? 4) Another issue concerns the right to die or the withdrawal of life-saving devices. Do our rights include one to die or do we have a responsibility to survive at all costs? What can we learn from people who have made such decisions? Does our position on this issue also reflect a judgment on the quality of life of disabled persons?

Course design: This course is intended for undergraduate students who have an interest in bioethics. A science background is not required, but students must have an interest in understanding the scientific basis of bioethical issues. Students must also have an interest in thinking about how they construct arguments and discussing different ways to present information in a clear and compelling manner. The course is intended for students from all departments and colleges. In the past, I have had students from anthropology, chemistry, engineering, history, molecular genetics and microbiology, and zoology in my classes. A diverse audience makes for a more interesting class since everyone has different backgrounds, different perspectives, and different interests to contribute to class discussions. Active participation is one of the strengths of the class in this regard.

Course objectives and student goals: All students are expected to gain knowledge on the scientific underpinning of bioethical issues that are encountered in daily life. Some of these issues are controversial and, in fact, have been chosen for their timeliness in terms of being currently debated in our society. Students may have to reflect on their personal views and their rationale for holding particular opinions. Thus, the class may be personally intense and demanding in a unique way relative to most college courses.

Critical thinking skills will be required throughout the course, both in evaluating the strength/weakness of different arguments and also in thinking how to present such information. In class presentations, you will focus on presenting arguments for particular views and evaluating the rationale and logic behind such arguments. You will have to research information relevant to different perspectives on a topic. For scientific material, students

should become familiar with searching PubMed (http://www.ncbi.nlm.nih.gov/pubmed) for peer-reviewed journal articles that investigate different perspectives on an issue. It is important to point out that critical thinking is not just a way of thinking, but you first need material to inform your thinking and on which to think critically.

Course material will consist of one book, newspaper articles, journal articles, movies, and blogs and other online material that reflect the contemporary nature of the issues we'll discuss. Students will be expected to do all required readings and follow up with additional readings and research to expand your understanding. Class participation and group projects, such as PowerPoint presentations, videos, blogs, skits, are a major part of the class. Group projects are an opportunity to be creative and explore your thoughts and opinions on an issue; students will present group projects every week.

Reading and course format: Reading material includes one textbook (Bioethics at the Movies, Sandra Shapshay, 2009, Johns Hopkins University Press). The textbook is available at campus bookstores and through online sources such as amazon.com and half.com. Additional reading materials, such as journal or online articles, blogs, etc will be required each week and links are available on the elearning course website. If students know of additional articles or topics that they would like to discuss, please contact me. The course meets two times per week for one hour on Tuesday and two hours on Thursday. The course format will be introduction to a new topic with lecture, video material and discussion on Thursday and on Tuesday, students will give presentations of an argument, and evidence for that argument, relevant to the topic. Presentations are graded on engaging the scientific evidence relevant to the topic, evidence of critical thinking, and clarity.

Grading: Final grades will be determined by the following five categories: 1) **participation** (100 pts), 2) two sets of **team-based learning quizzes** (1 individual and 1 team) (50 points total) 3) group grade on **group projects** (100 points), 4) 2 individual **oral presentations** (50 pts total), 5) **peer grades** for group projects (25 points), and 6) one **paper** (100 pts). Possible points total 425.
Grades will be based on the following point percentages: 93-100%=A, 90-93%=A-, 87-90%=B+, 83-87%=B, 80-83%=B-, 77-80%=C+, 73-77%=C, 70-73%=C-, 67-70%=D+, 63-67%=D, 60-63%=D-, <60%=E. The university grading policy can be found at https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx.

- **Participation** is required of all students and will be based on each student's contribution of original comments, questions, etc to the class. Students are not graded on the brilliance of their statements, but on their willingness to talk, a demonstration that the assigned material was read, and evidence that the students have thought about the material. Participation also includes presenting and defending team decisions in the team-based learning modules. Simply showing up for class does not constitute participation. Remaining silent in class means that the highest grade a student can receive will be lower than a B.
- **Team-based learning quizzes** – The class will include two team-based learning modules (Race and Genetic screening III). A key feature of team-based learning is readiness assurance tests to ensure that all students are prepared and have completed all of the assigned readings prior to class. Readiness assurance tests are administered as individual and team tests. There will be two sets of readiness assurance tests (individual and team) for the two team-based learning modules.
- **Group project** –Virtually every week, students will work in groups of ~4 students to create a group project. The lowest grade will be dropped. The majority of group projects will be a 5-10 min PowerPoint presentation. Students are encouraged to explore alternative group projects (e.g. podcast, short video, website, short play, etc) and at least one group project must be something other than a PowerPoint presentation. Each group project will present a certain side, and take a distinct stand, on an aspect of the bioethical issue being discussed that week. Each group project must have a clear scientific underpinning. Students will work on the projects outside of class– you can work in person, or virtually, but each project should be a group effort. If any group experiences problems, i.e. a member of the group is not contributing to the projects, please notify me as soon as possible so we can rectify the problem.
- One member of each group will present their group's PowerPoint as an **oral presentation** to the class each week. The members of each group will decide who presents each week. If it's appropriate to the

presentation, more than one group member can present in one week. Throughout the semester, each student will give (at least) 2 oral presentations.

- Within each team, team members will assign **peer grades** to their team mates to reflect their contributions during the team-based learning modules and the group projects.
- For your **paper**, you will choose a bioethical issue to discuss. Students should use the paper as an opportunity to investigate a new perspective or new opinion as opposed to something the student has already thought about exhaustively. There must be a clear scientific aspect to the issue you choose and you must explain the science and how it relates to your chosen bioethical issue, in addition to developing the bioethical issue. The paper will be due April 23. The expected length of the paper is ~3000 words or ~5-7 single-spaced pages.

Strategies for success:

- "Learning is not a spectator sport. Fundamentally, the responsibility to learn is yours and yours alone. For learning to happen in any course, you must take an active role in the process. For our class, you are expected to come to class 'prepared' and 'ready to learn', which requires you to read and to study the assigned reading before you come to class." Excerpted from Romack 2010, Enhancing Students' Readiness to Learn, Faculty Focus Special Report: 11 Strategies for Getting Students to Read What's Assigned.
- Furthermore, to get the most out of class, you must arrive on time (5 minutes late is not on time) and you must not use computers for non-class-related activities or use cell phones during class. While you may think that you can multi-task and follow the lecture or discussion while playing on your phone, you will definitely learn less and get less out of the course than if you give class your undivided attention. Finally, punctuality is a show of respect for your instructor and classmates and is important not just in class but in your job and eventual career.
- It is important to complete all the readings on time and it is best to read the readings throughout the week. In this way, you have time to think about and process the information during the week and in between different readings. Ideally, you would read some every night of the week. The amount of reading material is very modest, particularly for an anthropology course.
- For the oral presentations, you will have to get started as early as possible each week in order to make quality presentations. I suggest using the end of class to choose a topic for the following week and dividing responsibilities for research and ppt creation during the following week. By the end of the semester, you will (hopefully) have learned how to efficiently choose and research a topic and create an informative and engaging presentation. If you are the one giving the presentation, it is a good idea to practice your entire presentation without any stops the night before your scheduled presentation – this ensures your talk is the correct length of time and develops good practice for all public speaking.

Useful websites:

http://www.ncbi.nlm.nih.gov/pubmed - National Library of Medicine database of over 11 million journal articles dating back to the 1960s

http://www.genome.gov/glossary.cfm – NIH-maintained glossary of genetic terms

http://bioethics.georgetown.edu/pcbe/reports/beyondtherapy/beyond_therapy_final_webcorrected.pdf - Beyond Therapy: Biotechnology and the Pursuit of Happiness, report from the President's Council on Bioethics, 2003 (353 pages)

http://www.genome.gov/LegislativeDatabase - Database of federal and state laws focused on genetic issues, such as genetic testing and counseling, insurance and employee discrimination, etc.

Class attendance and behavior policy: Because the class format is mainly discussion, it is very difficult to make up missed classes by borrowing notes, etc. Therefore, students are strongly encouraged to attend all classes and to arrive on time. Punctuality is important because I summarize important logistical items at the beginning of class and because punctuality demonstrates professionalism and responsibility. Computers should be used sparingly in class. In a seminar format, it is more important to participate in class discussions than record everything on your computer. Additionally, it can be very off-putting to speak to a sea of laptop backs. Class discussions/lectures cannot be recorded in any manner without special permission. All cell phones must be turned off during class.

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Accommodations for students with disabilities: If you require accommodation due to a disability, please make an appointment during my office hours so that we may discuss your needs. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

Academic honesty: As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

The latest student honor code and student conduct code can be found at https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/

An excellent website that discusses plagiarism, correct citing of references and correct use of quotes is http://mediasite.video.ufl.edu/mediasite/Viewer/?peid=adaa44500eaf460a84f238e6b9a558f9. All students should read this material at least once. Remember that the university considers self-plagiarism to be plagiarism.

UF Counseling Services: On-campus services are available for students having personal problems or lacking clear career and academic goals. They include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling
2. Student Mental Health, Student Health Care Center, 392-1171, personal counseling
3. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual assault counseling
4. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling
5. Additionally, student web-based resources on sexual harassment are available at http://www.ufsa.ufl.edu/students/sh/sexualharassment.shtml

U Matter We Care

Your well-being is important to the University of Florida. The U Matter We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Course schedule:

January 8 – Introduction

- Course format
- What do we mean by bioethics?
- Memory exercise
- How to read a scientific journal article

- Sample PubMed search
- Sample oral presentation
- Create study groups for group presentations
- Assessment of class opinions and experiences concerning bioethical issues

January 10 - **Team-based learning AND Science in our daily lives**

- What is team-based learning?
- How can team-based learning be used to help make difficult decisions about ethical issues?
- What do people think about science and scientific data?
- How should scientific data be used?

Video – TED talk, John Wilbanks: Let's pool our medical data, http://www.ted.com/talks/john_wilbanks_let_s_pool_our_medical_data

Required reading (pdfs are posted on the course webpage):

- Team-based learning handout #1
- Team-based learning handout #2
- The essential elements of team-based learning, Michaelsen and Sweet, 2008, New Directions for Teaching and Learning, 116, DOI: 10.1002/tl.330.
- America's crisis of faith in science - http://www.sciencemag.org/content/348/6234/511.1.full?utm_campaign=email-sci-toc&utm_src=email

January 15 – **Race (Team-based learning module)**

- Is there a biological basis to race?
- How have we evolved?
- Global distribution of genetic and phenotypic variation
- How different are we?
- Estimates of genetic ancestry
- Genetic ancestry testing
- Racial disparities in health

Required reading (pdfs are posted on the course webpage):

- Wikipedia entry on 'Race and Genetics', http://en.wikipedia.org/wiki/Race_and_genetics
- Race: The Power of an Illusion, interview with Alan Goodman, http://www.pbs.org/race/000_About/002_04-background-01-07.htm
- Examining how race, ethnicity, and ancestry data are used in biomedical research, Bonham et al., 2018, Journal of American Medical Association, 320:1533-1534, https://jamanetwork.com/journals/jama/fullarticle/2703957 (pdf on course webpage)
- Attitudes on DNA ancestry tests, Wagner and Weiss, Human Genetics, 2012, 131:41-45, http://www.springerlink.com/content/u13v454847120454/fulltext.pdf (pdf on course webpage)
- Sample Genetic ancestry report, intended for an African American audience (pdf on course webpage)

January 17 **Race – Team-based learning application**

January 22 – **Race**

Video – African American Lives

January 24 - **Genetic screening I/Genetic testing**

- Genetic testing for disease risk
- Prenatal screening
- Testing for personality, mate choice, etc
- How should genetic information be used?

Required reading (pdfs also listed on course webpage):

- When 'Where are you from?' Takes You Someplace Unexpected, NPR Aug 10, 2017, https://www.npr.org/sections/codeswitch/2017/08/10/541921634/when-where-are-you-from-takes-you-someplace-unexpected?utm_source=npr_newsletter&utm_medium=email&utm_content=20170813&utm_campaign=&utm_term?utm_source=npr_newsletter&utm_medium=email&utm_content=20170813&utm_campaign=&utm_term
- Genetic testing can change behavior, Singer, 2010, MIT Technology Review, http://www.technologyreview.com/blog/editors/25297/
- Pregnancy: Prepare for unexpected prenatal test results, Bianchi, 2015, Nature, http://www.nature.com/news/pregnancy-prepare-for-unexpected-prenatal-test-results-1.17655
- Chloe's Law: A powerful legislative movement challenging a core ethical norm of genetic testing, Caplan, 2015, PLOS Biology, https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1002219 (pdf on course webpage)
- Divulging DNA secrets of dead stirs debate, Couzin-Frankel, Science, 2014, 343:356-357, http://www.sciencemag.org/content/343/6169/356.full (pdf on course webpage)
- Should police have access to genetic genealogy databases? Capturing the Golden State Killer and other criminals using a controversial new forensic technique, Guerrini et al. 2018, PLOS ONE, https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.2006906 (pdf on course webpage)
- The ethics of catching criminals using their family's DNA, Nature, May 2, 2018 https://www.nature.com/articles/d41586-018-05029-9?WT.ec_id=NATURE-20180503&utm_source=nature_etoc&utm_medium=email&utm_campaign=20180503&spMailingID=56542290&spUserID=MjA1NzYzMjUzNAS2&spJobID=1400463867&spReportId=MTQwMDQ2Mzg2NwS2 (pdf on course webpage)

- Work on first group presentations

January 29 - **Genetic testing group presentations**

January 31 – **Genetic screening II/Eugenics**

- Eugenics
- Genome modification
- Designer babies
- Pre-implantation genetic testing

Required reading:

- Bioethics at the Movies (BAM)
  - Chpt 5 ("No Gene for Fate?": Luck, Harm, and Justice in *Gattaca*)
  - Chpt 6 (Lifting the Genetic Veil of Ignorance: Is there anything really unjust about *Gattacan* society?)
- http://en.wikipedia.org/wiki/Eugenics - Wikipedia entry on eugenics

Video – *GATTACA*

February 5 - **Genetic screening II/Eugenics presentations**

February 7 – **Genetic screening III/Genome editing and gene therapy (Team-based learning module)**

- Genome editing, CRISPR/Cas9
- Gene therapy
- Gene therapy case study at UF

Required reading (also listed on course webpage):

- What is CRISPR/Cas9?, Your Genome, https://www.yourgenome.org/facts/what-is-crispr-cas9
- Genome-editing revolution: My whirlwind year with CRISPR, Doudna, 2015, Nature, http://www.nature.com/news/genome-editing-revolution-my-whirlwind-year-with-crispr-1.19063?WT.ec_id=NATURE-20151224&spMailingID=50325468&spUserID=MjA1NzYzMjUzNAS2&spJobID=823531954&spReportId=ODIzNTMxOTU0S0
- CRISPR/Cas system: A game changing genome editing technology, to treat human genetic diseases, Hussain, et al, 2019, Gene, 685: 70-75, https://reader.elsevier.com/reader/sd/pii/S0378111918311168?token=221584D67E46ED70502E61C26589527B9974458B693462FABA89113A489797F92C3085AE3825DD300CF184096B6EC467 (pdf on course webpage)
- US scientists modify human embryos with CRISPR/Cas9, Lawrenz, 2017, BioTechniques, https://www.future-science.com/btn/news/aug17/04
- Chinese scientist claims to use CRISPR/Cas9 to make first genetically edited babies, NYT, Nov 26, 2018, https://www.nytimes.com/2018/11/26/health/gene-editing-babies-china.html
- China shrinks from the GATTACA age, Campbell, December 5, 2018, Bloomberg Businessweek, https://www.bloomberg.com/news/articles/2018-12-05/china-fiercely-decries-he-jiankui-s-human-gene-editing
- UF's Explore article on UF's Barry Byrne's research on Pompe disease and how it was made into a movie, 2010, https://research.ufl.edu/publications/explore/past/fall2010/story_2/documents/Extraordinary_Measures.pdf (pdf on course webpage)

Video – *Extraordinary Measures*

February 12 - **Genetic screening III/Genome editing and gene therapy (Team-based learning module)**

February 14 - **Cloning**

- What is cloning?
- Can we clone humans?
- Are two genetically identical humans really the same individual?

Required reading

- Bioethics at the Movies (BAM)
  - Chpt 7 (*Multiplicity*: A study of cloning and personal identity)
- Neanderthals are people too, NYT, April 24, 2014 - http://www.nytimes.com/2014/04/25/opinion/neanderthals-are-people-too.html?emc=edit_th_20140425&nl=todaysheadlines&nlid=60704772
- Cloning humans? Biological, ethical, and social considerations, Ayala, 2015, PNAS - http://www.pnas.org/content/112/29/8879.full?sid=c34596b7-09fa-45b4-8b3f-d3e6a0de3fa2 (pdf on course webpageP

Video – *Multiplicity*

February 19 - Cloning group presentations

February 21 – Robots/machine learning

- What rights do robots/clones/unborn babies have?
- Self-replication – Organisms and DNA
- Blurring the line between humans and robots
- Machine learning and the future

Required reading (also listed on course webpage):

- Bioethics at the Movies (BAM)
  - Chpt 3 (*Homo sapiens*, robots, and persons in *I, Robot* and *Bicentennial Man*)
- To make robots more human-like, we need to teach them how to be mind readers, Azarian, Oct 25, 2016, Quartz.com, https://qz.com/817476/to-make-robots-more-human-like-we-need-to-teach-them-how-to-be-mind-readers/
- New self-healing technology makes robots more human-like, Ratner, Oct 23, 2018, BigThink.com, https://bigthink.com/technology-innovation/why-researchers-are-making-robots-you-can-stab
- Machine learning healthcare applications – 2018 and beyond, Faggella, Dec 5, 2018, Emero Healthcare, https://emerj.com/ai-sector-overviews/machine-learning-healthcare-applications/

Video –*Bicentennial Man*

February 26 - Robots/personhood/personal identity group presentations

February 28 – Stem cells

- Different types and uses of stem cells
- Status of stem cell research
- Current and potential applications of stem cells

Required reading (also listed on course webpage):

- Stem Cell Quick Reference, https://learn.genetics.utah.edu/content/stemcells/quickref/
- UM professor on stem cell research today, http://www.youtube.com/watch?v=HZWVj5mqJ1I&feature=channel (watch the video)
- Pros and cons of stem cell research, https://www.allaboutpopularissues.org/pros-and-cons-of-stem-cell-research.htm
- Spinal-cord injury: spurring regrowth, Holmes, 2017, Dec 2017, https://www.nature.com/magazine-assets/d41586-017-07550-9/d41586-017-07550-9.pdf
- Stem cell therapies for spinal cord injury, Sahni and Kessler, 2010, Nature Reviews Neurology, 6:363-372, https://www.nature.com/articles/nrneurol.2010.73 (pdf on course webpage)

Video – PBS documentary on stem cell research

March 5, 7 Spring break

March 12 - Stem cell group presentations

March 14 - Organ donation/Exploitation

- Organ donation/wait lists/commodification of organs

- Exploitation of individuals in developing countries/poor people
- Informed consent/Issue of greater good

Required reading (also listed on course webpage):
- Bioethics at the Movies (BAM)
  - Chpt 11 (Commodification, exploitation, and the market for transplant organs/*Dirty Pretty Things*)
  - Chpt 18 ("If you could cure cancer by killing one person, wouldn't you have to do that?"/*Extreme Measures*)
- A shocking discovery, Semeniuk, *Nature*, Oct 4, 2010, 467:645, http://www.nature.com/news/2010/101004/full/467645a.html
- Genes, cells, and biobanks: Yes, there's still a consent problem, Caulfield and Murdoch, 2017, PLOS Biology, https://journals.plos.org/plosbiology/article/file?id=10.1371/journal.pbio.2002654&type=printable (pdf on course webpage)

Video – *Never Let Me Go*

March 19 - Organ donation/exploitation group presentations
- For/against organ commodification
- For/against harming few people for greater good

March 21 - Right to die
- Withdrawal of life-sustaining treatment
- Right to die
- Relevance to people with disabilities

Required reading (also listed on course webpage):
- Bioethics at the Movies (BAM)
  - Chpt 14 (False images: Reframing the end-of-life portrayal of disability in *Million Dollar Baby*)
  - Chpt 15 ("I can't be like this, Frankie, not after what I've done": *Million Dollar Baby* and the value of human lives)
- http://www.nytimes.com/2011/03/04/us/04immigrant.html?pagewanted=1&nl=todaysheadlines&emc=tha23 – Immigrant's health crisis leaves her family on sideline, New York Times, March 3, 2011
- http://news.yahoo.com/british-court-die-case-proceed-174823598.html - British court: Right to die case can proceed
- http://www.amazon.com/Breath-Lifetime-Rhythm-Iron-Memoir/dp/1608191192 - Breath: A Lifetime in the Rhythm of an Iron Lung: A Memoir – read reviews also

Video – *Million Dollar Baby*

March 26 - Right to die group presentations
- For/against right to die
- For/against – *Million Dollar Baby* argues that a disabled life is not worth living

March 28 - Quest for good life/death
- Technological innovations for improved happiness
- Memory deletion as a means to happiness
- Can a good death compensate for an impoverished life?
- Assisted suicide

Required reading (also listed on course webpage):

- Bioethics at the Movies (BAM)
  - Chpt 9 ("Blessed are the forgetful": The ethics of memory deletion in *Eternal Sunshine of the Spotless Mind*)
  - Chpt 17 (The thanatoria of *Soylent Green*: On reconciling the good life with the good death)
- Revisiting propranolol and PTSD: Memory erasure or extinction enhancement, Giustino et al. 2016, Neurobiology of Learning and Memory, https://ac.els-cdn.com/S1074742716000216/1-s2.0-S1074742716000216-main.pdf?_tid=0a80a2a2-d982-4326-8f97-0eefca79d62d&acdnat=1544565636_d9bbb0c8ba30dd0dbd534b404f0be786 (pdf on course webpage)
- Scientists trace memories of things that never happened, NYT, July 25, 2013, http://www.nytimes.com/2013/07/26/science/false-memory-planted-in-a-mouse-brain-study-shows.html?src=me&ref=general

Video – *Eternal Sunshine of the Spotless Mind*

April 2 - **Quest for good life/death group-led discussions**

- For/Against memory deletion as a means of happiness
- For/Against other technological/pharmaceutical interventions as a means of happiness

April 4 - **Animal cognition/animal rights**

- Animal experimentation/exploitation
- Vegetarianism and other uses of animals
- Animal testing/medical advances
- Animal cognition/what separates us from other animals?

Required reading (also listed on course webpage):

- Bioethics at the Movies (BAM)
  - Chpt 4 (The *Babe* vegetarians: Bioethics, animal minds, and moral methodology)
- "Wanted: Intelligent aliens, for a research project", Olivia Judson, New York Times, Sept 30, 2008, http://opinionator.blogs.nytimes.com/2008/09/30/wanted-intelligent-aliens-for-a-research-project/
- ***Controversial – Think organic food is better for you, animals, and the planet/ Think again, Lomborg, The Telegraph, 2016, https://www.telegraph.co.uk/news/2016/06/12/think-organic-food-is-better-for-you-animals-and-the-planet-thin/
- A searchable website that documents scientific advances made through animal research - http://www.animalresearch.info/en/medical-advances/diseases-research/

Video – *Babe*

April 9 - **Animal cognition/animal rights group presentations**

- For/against vegetarianism
- Huge/small differences between us and other animals

April 11 - **Human origins/Admixture with archaic hominids**

- Human genetic variation
- Human evolution
- Archaic hominids and admixture with modern humans

Required reading (also posted on course webpage):

- http://www.sciencemag.org/content/349/6246/362.full?sid=b053f6c4-8ff7-4327-9d3a-a1b138ed406c - Revolution in human evolution, Ann Gibbons, Science, July 2015, 349: 362-366
- http://www.nature.com/news/neanderthals-had-outsize-effect-on-human-biology-1.18086 - Neanderthals had an outsize effect on human biology, Callaway, Nature, July29, 2015, 523:512–513.
- http://www.sciencemag.org/content/348/6237/847.full?utm_campaign=email-sci-toc&utm_src=email – Ancient DNA pinpoints Paleolithic liaison in Europe, Gibbons, Science, 2015, 348: 847
- http://www.nature.com/nature/journal/v507/n7492/full/nature12961.html - The genomic landscape of Neanderthal ancestry in present-day humans, Sankararaman et al. Nature, 2014, 507: 354-357

Video – TED lecture - Svante Paabo: DNA clues to our inner Neanderthal

April 16 - **Human origins group discussions or presentations**

April 18 - **Evolution/intelligent design**

- Scientific basis of evolution and creationism/intelligent design
- Should evolution/creationism/intelligent design be required subjects to teach? In what classes?

Required reading

- Talbot M. 2005. Darwin in the Dock. *The New Yorker*, pp 66-77, http://go.galegroup.com/ps/infomark.do?source=gale&srcprod=AONE&tabID=T003&userGroupName=gain40375&prodId=AONE&action=interpret&docId=A139444013&type=retrieve&contentSet=IAC-Documents&version=1.0
- Berkman MB et al. 2008. Evolution and Creationism in America's Classroom: A National Portrait. *PLoS Biology*, 6:0920-0924 - http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.0060124 (pdf on course webpage)
- The evolution of antievolution policies after Kitzmiller vs Dover, Matzke, 2016, Science, 351:28-30, http://science.sciencemag.org/content/351/6268/28.full?utm_campaign=email-sci-toc&et_rid=34819171&et_cid=186003-Talbot%20M.%202005.%20Darwin%20in%20the%20Dock (pdf on course webpage)

Course evaluations

April 23 - **Evolution/intelligent design debates**

Paper due