Graduate Seminar in Neuroethics
The Neuroethics Learning Collaborative

Spring 2010, M.J. Farah, Course Director

This is a new graduate course in neuroethics, intended for neuroscience graduate students, being developed and offered with support from the NSF. It will include a combination of traditional classroom lectures, discussion and debates, as well as an online component coordinated with a course at Wisconsin's Neuroscience and Public Policy graduate program. The NSF proposal, attached, includes background information.

In brief, this is the rationale: Neuroscience is increasingly affecting all aspects of human life, from the relatively familiar medical applications in neurology and psychiatry, to new applications in education, business, law and the military. Today's neuroscience graduate students will be among the scientists, citizens and policymakers who will lead society through the maze of decisions regarding the appropriate uses of neuroscience. This course provides a survey of the key ethical, legal and social issues at the intersection of neuroscience and society.

Assignments: The first requirement is to complete the assigned reading prior to the class to which it is relevant. The reading will consist of 2 articles, on average, per class. Readings will be posted on the NLC site. The second requirement is to participate in at least one half of the Discussion Forums, which are threaded online discussions kicked off by short video blog entries. The third assignment is to prepare for and participate in each of the two student debates. In addition, each student will write a research paper on a topic selected in consultation with the instructor.

Time: Mondays 5-7:45. Place: TBA
Readings listed below are provisional and some will be changed.

SECTION I: Introduction to Ethics and Neuroethics
Week 1

Class 1. Philosophical ethics: Frameworks, theories, assumptions (Moreno and Farah)
Readings: Shelly Kagan, Normative Ethics
Link: http://books.google.com/books?id=YllnYJ9R0q0C&printsec=frontcover&source=gbs_navlinks_s#v=onepage&q=&f=false

Class 2. Applied ethics: Principles, controversies and critiques; and Neuroethics as a field (Farah)
Readings: Jonathan Moreno, “Neuroethics: An Agenda for Neuroscience and Society”
Link: http://www.nature.com/nrn/journal/v4/n2/full/nrn1031.html?message=remove
Martha Farah, “Neuroethics: the Practical and the Philosophical,”
Link: http://repository.upenn.edu/cgi/viewcontent.cgi?article=1008&context=neuroethics_pubs

SECTION II: Neuroethical Issues in the Lab and Marketplace

Neuroethical issues concerning research subjects

**Week 2**
DISCUSSION FORUM 1: *Why all the %#$& paperwork? A history of human subjects abuses* (Moreno)

**Class 3.** Neuroethics of human subjects research: Consent issues with “decisionally impaired” neuroscience research subjects (Karlawish)

Link: http://repository.upenn.edu/neuroethics_pubs/34/

**Class 4.** Neuroethics of animal subjects research (Feister)

*Readings:*

Ethical issues in the commercialization of neuroscience

**Week 3**
**Class 5.** Regulating neuroscience – drugs, devices and procedures to monitor and modify the brain (Merz)

*Readings:*


**Class 6.** Conflict of interest (Merz)

*Readings:* Katz D, Caplan AL, Merz JF. “All gifts large and small: toward an understanding of the ethics of pharmaceutical industry gift-giving.” Link: http://www.ncbi.nlm.nih.gov/pubmed/14594489

DISCUSSION FORUM 2. “Between an academic research rock and a profitable hard place: Penn’s Vice Provost for Research discusses the challenges of putting principles into practice concerning conflict of interest,” (Fluharty)

**Week 4**

DISCUSSION FORUM 3 Selling the “neuro lifestyle” (Farah)
Panel Discussion 1: Panel on neuroethical issues in the lab and marketplace (Karlawish, Feister, Hogle, Kalil, Merz)

SECTION III: Brain enhancement

Neuroethics of psychopharmacological brain enhancements

Class 7. Neurochemistry and psychopharmacology refresher (Fluharty) [WK 4]
Readings: Neural foundations to moral reasoning and antisocial behavior\textsuperscript{21}, Adrian Raine and Yaling Yang

Week 5
DISCUSSION FORUM 4. “Cosmetic neurology” (Chatterjee) [WK 5]

Class 8. Better brains: Cognitive enhancement in a competitive world (Farah) [WK 5]

Class 9. Enhancement of mood, memory erasure, and counteracting antisocial behavior (Farah) [WK 5]

Week 6.
DISCUSSION FORUM 5. Enhancement of wakefulness and the 24/7 society (Dinges) [WK 6]

Panel Discussion 2: Panel on pharmacologic brain enhancement (Chatterjee, Farah, Hogle, Kalil, Raine)

Neuroethics of nonpharmacological brain interventions

Class 10. Neuroengineering refresher and nonmedical uses for brain-machine interfaces (Foster) [WK 6]
Week 7
DISCUSSION FORUM 6. Stem cell chimeras: Thinking about the human neuron mouse (Hogle, Wisc) [WK 7]

Class 11. Brain stimulation, from the inside (DBS) and outside (TMS, DCS); risks and regulatory issues, research, medical and nonmedical applications, with demos (Hamilton) [WK 7]


Student Debate 1: The human brain 2.0: Should we upgrade human cognition? [WK 7]

SECTION IV: Brain imaging

Week 8
DISCUSSION FORUM 7. You saw WHAT in my brain? Incidental findings in research scans (Detre)


Class 12. Neuroimaging refresher (Aguirre) [WK 8]


Class 13. Imaging of personality, attitudes and truthfulness; privacy issues (Farah) [WK 8]


**Week 9**

DISCUSSION FORUM 8: The neurocurmudgeon is in: How the public, with a little help from scientists, overestimates the real-world significance of findings in neuroscience, especially brain images (Farah) [WK 9]

Panel Discussion 3. Panel on ethics of brain imaging (Aguirre, Foster, Hogle, Kalil, Morse) [WK 9]

SECTION V: More on the “Neurosociety”

*New societal applications that span enhancement and imaging*

**Class 14.** Neuroscience in the military: ethical issues surrounding dual use (Moreno)


**Implications of neuroscience for morality and the law**

**Week 10**

**Class 15.** Responsibility, free will, and the brain (Morse)


**Class 16.** Predicting antisocial behavior: From profiling and genetics to neuroendocrinology and neuroimaging (Raine)

*Readings:*


**Week 11**

DISCUSSION FORUM 9: Neuroethics and Public Policy (Kalil, Wisconsin)

Panel Discussion 4. Panel discussion on neuroethics and the law (Farah, Hogle, Kalil, Morse, Raine)

SECTION VI: Summing up, reviewing, consolidating
Student Debate 2. The next ten years of neuroscience and society: promise or peril – or hype? (Students debate)