

STS 597A / E SC 597B
Perspectives in Neuroethics and Neurolaw
Spring 2009

Tuesday, 2:30pm - 4:25pm
Jan. 13 - March 3, 2009
101A Old Botany

Instructors: Jonathan H. Marks, 201D Old Botany, 865 5938, marks@psu.edu;
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Office Hours: Tuesday, 10am - Noon (or by appointment)

Prerequisite: This is a graduate course designed for Ph.D. students in a variety of disciplines (including neuroscience, engineering, psychology and philosophy) and for law students. However, undergraduate students in the Schreyer Honors College may enroll in this course with the approval of the instructor.

Overview: This interdisciplinary course will explore some of the ethical and legal issues raised by a variety of recent developments in neuroscience including neuroimaging and neurostimulation. The course will also address non-therapeutic applications of neuroscience - in particular, its use in the legal system and for national security purposes - and it will explore the ethical issues raised by these applications. This course will help meet the ethics requirement for students whose NIH or NSF sponsored fellowships require such ethics training.

Objectives:

- Students will learn to identify potential ethical and legal issues arising from recent developments in neuroscience.
- Students will develop their own approaches for addressing these ethical and legal issues. These approaches will be informed by the readings and class discussion, and by the analytical skills acquired during the course.
- Students will enhance their writing and communication skills by addressing ethical and legal issues related to neuroscience in both written work and class discussion.

Required Texts:

Readings will be posted on the ANGEL website (<http://cms.psu.edu>), except where direct links to the articles are provided in this syllabus. The readings will be selected from a variety of books and journals on neuroscience, ethics and law. Some of these texts are also listed below; they are valuable sources for further reading and research.

Selected Books

- Ackerman, S. (ed.) *Hard Science, Hard Choices: Facts, Ethics, and Policies Guiding Brain Science Today* (Dana Press, 2006)
- Bernat, J.L. *Ethical Issues in Neurology* (Lippincott Williams & Wilkins, 2008)
- Bloom, F. (ed.) *Best of the Brain from Scientific American: Mind, Matter, and Tomorrow's Brain* (Dana Press, 2007)
- Garland, B. (ed.) *Neuroscience and the Law: brain, mind and the scales of justice* (Dana Press, 2004)
- Gazzaniga, M. *The Ethical Brain: The Science of Our Moral Dilemmas* (HarperCollins, 2005)
- Glannon, W. *Bioethics and the Brain* (Oxford University Press, 2006)
- Glannon, W. (ed.) *Defining Right & Wrong in Brain Science: Essential Readings in Neuroethics* (Dana Press, 2007)
- Illes, J. (ed.) *Neuroethics: Defining the Issues in Theory, Practice and Policy* (Oxford University Press, 2006)
- Levy, N. *Neuroethics: Challenges for the 21st Century* (Cambridge University Press, 2007)
- Moreno, J.D. *Mind Wars: Brain Research and National Defense* (Dana Press, 2006)
- Marcus, S. *Neuroethics: Mapping the Field* (Dana Press, 2002)
- Rees, D. & S. Rose. (eds.) *The New Brain Sciences: Perils and Prospects* (Cambridge University Press, 2004)
- Rose, S. *The Future of the Brain: The Promise and Perils of Tomorrow's Neuroscience* (Oxford University Press, 2005)
- Tancredi, L. *Hardwired Behavior: What Neuroscience Reveals about Morality* (Cambridge University Press, 2005)
- Wolpe, P.R. *Neuroethics* (Ashgate Press, forthcoming)
- Zeki, S. and O. Goodenough (eds.). *Law and the Brain* (Oxford University Press, 2006)

Selected Journals

- Am. J. Bioethics – Neuroscience*, <http://bioethics.net/journal/>
- Ann. Rev. Neuroscience*, <http://neuro.annualreviews.org>
- Behavioral Brain Res.*, <http://www.sciencedirect.com/science/journal/01664328>
- Human Brain Mapping*, <http://www3.interscience.wiley.com/journal/38751/home>
- J. Cognitive Neuroscience*, <http://jocn.mitpress.org/>
- J. Neuroscience*, www.jneurosci.org/

Nature Neuroscience, www.nature.com/neuro/
Nature Reviews Neuroscience, <http://www.nature.com/nrn/index.html>
Neuroethics, <http://www.springerlink.com/content/1874-5490> (free text)
Neuroimage, www.ingenta.com/journals/browse/ap/ni
Neuron, <http://www.cell.com/neuron/archive> (free text)
Scientific American: Mind, www.sciam.com/sciammind/
Social Neuroscience, www.social-neuroscience.com
Trends in Cognitive Science, <http://www.sciencedirect.com/science/journal/13646613>
Trends in Neuroscience, <http://www.sciencedirect.com/science/journal/01662236>

Other academic journals that are broader in scope may devote issues to neuroscience-related topics (for example, the *American Journal of Law and Medicine's* symposium issue in 2007 was on "Brain Imaging and the Law"). In addition, *Nature* and *Science* often run neuroscience articles, and magazines intended for a general readership (such as the *New Yorker* or *Wired*) often run articles on issues relating to neuroscience or neuroethics.

Penn State's Neuroimaging Reading Group has links to some useful journal articles and readings on the web: <http://www.personal.psu.edu/rog1/neuro.html>.

There are also some informative postings on this neuroethics and law blog: http://kolber.typepad.com/ethics_law_blog/ For a list of other useful websites, see <http://neuroethics.upenn.edu/websites.html>

In addition, you can watch presentations from several recent neuroethics conferences on the web. See, for example:

"Implanting Change: The Ethics of Neural Implants" Conference at Penn State, August 2007, <http://rockethics.psu.edu/bioethics/events/neuroethics.shtml>

"Neuroscience, Law and Government" University of Akron, OH, September 2008, <http://www.uakron.edu/law/neurosymposium.php>

"Beyond Belief: Candles in the Dark" The Science Network, October 2008, <http://thesciencenetwork.org/programs/beyond-belief-candles-in-the-dark>

Course Assessment:

- **Class Participation = 20%**

The class will be run as a seminar. Students are expected to contribute to class discussion. Extra credit will be given for attendance at other lectures or conference sessions/panels in neuroethics or related fields, *provided* students

submit a two-page response paper relating to the event. These events will be designated by or agreed with the instructor in advance.

- **Take-Home Assignment = 80%**

You will be given a take-home assignment at the end of the class on Tuesday, March 3rd. The assignment will require short essay responses to questions raising issues of neuroethics and law. Your responses will be due by *5 pm* on *Friday, March 6, 2009*. Extra credit will be given for independent research.

Course Policies

- **Submission of written work**

- Written work should be double-spaced with footnotes in a consistent format, and a bibliography.
- Papers may be submitted by email (the instructors' email addresses are listed above) or in duplicate hard copy at 102 Old Botany.
- ***Please note:*** Sending an email which states that the paper is attached does not count as turning in a paper if the attachment is omitted, even if this is an error or oversight! (This will be considered a non-submission.) Students are strongly encouraged to attach the paper in Word format and to cut and paste it into the body of the email as a precaution.

- **Late Policy**

Papers and assignments will be lowered half a grade for every day (or part of a day) that they are late *unless* there are exceptional circumstances supported by documentation.

- **Academic Integrity**

Plagiarism or any other form of academic dishonesty will be dealt with severely. The minimum penalty for academic dishonesty is a failing grade for the assignment. Additional disciplinary steps may be taken in accordance with the guidelines and procedures established by the University. Information about

official University policies and procedures on academic integrity can be found at <http://www.la.psu.edu/undergrad/integrity/studentpolicy/studentres.htm>. If you have any doubt about what constitutes plagiarism or academic dishonesty, please ask the instructor *before* you submit any written work.

- **Students with Disabilities**

If, as a result of a disability, you require a modification to or reasonable accommodation in this course, please contact the Office for Disability Services (ODS), located in room 116 Boucke Building at 814-863-1807(V/TTY). For further information regarding ODS, please go to www.equity.psu.edu/ods. Please discuss with the instructor as soon as possible any such modification or accommodation.

Note: This course will count towards the Graduate Minor in Science, Technology and Society, the Dual Title Degree Program in Bioethics (currently under development) and the Undergraduate Minor in Bioethics and Medical Humanities (see <http://bioethics.psu.edu>).

Class Schedule and Reading Assignments

Class 1 (Jan 13): Introduction to the Brain, Neuroscience and Neuroethics

Kenneth Weiss and Kristina Aldridge, "What Stamps the Wrinkle Deeper on the Brow?" *Evolutionary Anthropology*, 12: 205 - 210 (2003), available at http://www.anthro.psu.edu/weiss_lab/CQ10_WrinkledBrow.pdf

Deena Skolnick Weisberg at al., "The Seductive Allure of Neuroscience Explanations" *Journal of Cognitive Neuroscience*, 20(3): 470 - 477 (2008), available at <http://pantheon.yale.edu/~dls73/Assets/Weisberg-JOCN.pdf>

Troy Duster, "What Were You Thinking: The ethical hazards of brain imaging studies" *The Chronicle Review*, October 10, 2008 at B4 - 5.

Robert H, Blank, "Neuroethics: Policy Implications of the New Neuroscience," *Cambridge Quarterly of Healthcare Ethics*, 16: 169 - 180 (2007)

Adam Keiper, "The Age of Neuroelectronics" *The New Atlantis*, (Winter 2006) (excerpts)

Further reading

NOTE: If you have not taken any bioethics course before, please also read: Daniel Callahan, "Bioethics" in *Encyclopedia of Bioethics* (3rd ed., 1995), Vol. 1, pp. 278 – 287

Class 2 (Jan 20): Neuroimaging and "Lie Detection"

Logothetis, N. "What We Can Do and What We Cannot Do with fMRI" *Nature*, 453: 869 – 878 (2008)

Illes, J. and E. Racine, "Imaging or Imagining? A Neuroethics Challenge Informed by Genetics," *American Journal of Bioethics*, 5(2): 5 – 18 (2005)

Wolpe, P.R. et al. Emerging Neurotechnologies for Lie Detection: Promises and Perils, *Am. J. Bioethics*, 5(2): 39 – 49 (2005)

Greely, H.T. and Illes, J. "Neuroscience-Based Lie Detection: The Urgent Need for Regulation" *33 Am. J. Law & Med.* 377 – 420 (2007)

Class 3 (Jan 27): Neuroscience and National Security¹

Canli, T. et al., "Neuroethics and National Security," *Am. J. Bioethics*, 7(5): 3- 13 (2007)

Moreno, J.D., *Mind Wars: Brain Research and National Defense* (2006)

"Of Machines and Men," 34 – 60; "Building Better Soldiers," 114 – 138;

"Toward an Ethics of Neurosecurity," 162 – 184

¹ This class will follow on from and reflect on Jonathan Moreno's lecture the day before on this topic. (This lecture – to be held in the Foster Auditorium at 3pm on Monday, January 26 – is entitled "Mind Wars: Brain Research and National Defense," and is part of the Rock Ethics Lecture Series "Bioethics Without Borders". See <http://rockethics.psu.edu/events/bwb0809.shtml>. Extra credit will be given for attending the lecture and writing a two-page response critiquing the lecture.) A copy of Moreno's book will be on reserve in the Pattee Library; further copies will be available in the Penn State bookstore.

Class 4 (Feb 3): Neurosurgery, Psychosurgery and Neurostimulation

Jack Pressman, "Human Salvage: Why Psychosurgery Worked in 1949 (and Not Now)" in *Last resort: Psychosurgery and the Limits of Medicine* (1998) at 194 - 235

Mayberg, H. et al. Deep Brain Stimulation for Treatment-Resistant Depression, *Neuron*, 45(5): 651-660 (2005), available at <http://download.cell.com/neuron/pdf/PIIS089662730500156X.pdf>

Fins J.J., et al. Psychosurgery : Avoiding an Ethical Redux While Advancing a Therapeutic Future. *Neurosurgery*. 59: 713 - 716 (2006)

Glannon, W.: "Neurosurgery, Psychosurgery and Neurostimulation" in "*Bioethics and the Brain*" at 116 - 147

Class 5 (Feb 10): Rethinking Consciousness

Jerome Groopman, M.D., "Silent Minds: What Scanning Techniques are Revealing about vegetative patients," *New Yorker*, October 15, 2007, available at http://www.newyorker.com/reporting/2007/10/15/071015fa_fact_groopman

Owen AM, et al. Detecting Awareness in the Vegetative State, *Science*, 313: 402 (2006)

Owen AM & Coleman MR. "Functional neuroimaging of the vegetative state." *Nature Reviews Neuroscience* 2008; 9: 235-243 available at: http://www.wbic.cam.ac.uk/~mrc30/Owen_Coleman_NNR_2008.pdf

Schiff, ND et al., "Behavioural improvements with thalamic stimulation after severe traumatic brain injury" *Nature* 448, 600-603 (2007), available at <http://www.nature.com/nature/journal/v448/n7153/full/nature06041.html> (from campus or VPN)

Farah, M. Neuroethics and the problem of other minds: Implications of neuroscience evidence for the moral status of brain-damaged patients and nonhuman animals. *Neuroethics*, 1: 9-18 (2008), available at: <http://www.springerlink.com/content/u2hnhm3r474245q7/fulltext.html>

Class 6 (Feb 17): Rethinking Morality

Casebeer, W. D. and Churchland, P. S. "The neural mechanisms of moral cognition: A multiple-aspect approach to moral judgment and decision-making" *Biology & Philosophy*, 18(1): 169 – 194 (2003), available at <http://philosophy.ucsd.edu/faculty/pschurchland/papers/biophilo03neuralmechdecmaking.pdf>

Greene, J.D. et al. (2004) The neural bases of cognitive conflict and control in moral judgment. *Neuron* 44, 389–400, available at <http://www.wjh.harvard.edu/~jgreene/GreeneWJH/Greene-et-al-Neuron04.pdf>

Koenigs, M. et al. (2007) Damage to the prefrontal cortex increases utilitarian moral judgements. *Nature* 446, 908–911

Moll, J. and de Oliveira-Souza, R. (2007) Moral judgments, emotions, and the utilitarian brain. *Trends Cogn. Sci.* 11, 319–321

Class 7 (Feb 24): Rethinking Criminal Responsibility and Punishment

Greene, J. and J. Cohen, "For the law, neuroscience changes everything and nothing" *Phil. Trans. R. Soc. Lond. B* 359: 1775 – 1785 (2004), available at <http://www.wjh.harvard.edu/~jgreene/GreeneWJH/GreeneCohenPhilTrans-04.pdf>

Morse, S.J. Brain Overclaim Syndrome and Criminal Responsibility: A Diagnostic Note, 3 *Ohio St. J. Crim. L.* 397 – 412 (2006) (critiquing submissions made to the Supreme Court in *Roper v. Simmons*, 543 U.S. 551 (2005)), available at http://moritzlaw.osu.edu/osjcl/Articles/Volume3_2/Symposium/Morse-PDF-04-05-06.pdf

Burns, J.M. and R.H. Swerdlow "Right Orbitofrontal Tumor With Pedophilia Symptom and Constructional Apraxia Sign" 60 *Arch. Neurol.* 437 – 440 (2003), available at <http://archneur.ama-assn.org/cgi/reprint/60/3/437> (from campus or VPN)

Bonnie, R. et al. The Impact of Modern Neuroscience on Treatment of Parolees: Ethical Considerations in Using Pharmacology to Prevent Addiction Relapse, *Cerebrum*, Nov. 25, 2008 available at <http://www.dana.org/printerfriendly.aspx?id=13932>

Class 8 (Mar. 7): Rethinking the Death Penalty

Background Reading (skim): Human Rights Watch. *So long as they die: lethal injections in the United States*. April 2006, available at <http://www.hrw.org/sites/default/files/reports/us0406webwcover.pdf>

Gawande, A. When Law and Ethics Collide – Why Physicians Participate in Executions, *N. Eng. J. Med.* 354: 1221-9 (2006), available at <http://content.nejm.org/cgi/reprint/354/12/1221.pdf>

Steinbrook, R. “New Technology, Old Dilemma – Monitoring EEG Activity during Executions” *N. Eng. J. Med.* 354: 2525 – 2527 (2006)

Annas, G. “Toxic Tinkering – Lethal-Injection Execution and the Constitution” *N. Eng. J. Med.* 359: 1512- 18 (2008) (critiquing the decision of the Supreme Court in Baze v. Rees, 128 S.Ct. 1520 (2008)), available at <http://content.nejm.org/cgi/reprint/359/14/1512.pdf>
