

Course Syllabus – EGR 501 - Ethics for Engineers (One credit) also: EAS 602, Research Ethics

Tuesdays: 5:00 – 6:30 pm (mostly online, 1-2 meetings in person)

Primary Instructor – Professor Dianne Quigley, PhD - Visiting Assistant Professor

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Team Instructors – Professor Tracie Ferreira, Professor Sankha Bohmick and Professor Gaurav Khanna

Course Description: Ethics for Engineers is a new one credit course that will provide ethics training to graduate students through an orientation to the topics in engineering ethics in order to prepare students to become familiar with discussions and methods for developing ethical approaches to engineering research and applied projects. Contemporary issues in engineering ethics will be presented through mostly on-line training resources but also several in-class discussions to hear lectures from several experts' experiences with ethical challenges in engineering. These issues include research integrity, professional ethics, human subjects protections, animal protections, intellectual property rights/ software patent issues and engineering ethics and sustainability.

Course Objectives – Students in this course will increase their understanding of the meaning of ethics in the engineering profession. They will become familiar with various discussions, debates and practices for dealing with engineering ethics challenges. Students will learn about relevant moral theories, categories of ethical decision-making, professional codes of ethics, the common morality (individual and group human subjects protections), animal protections, intellectual (software) property rights and various case studies and field guidance perspectives to deal with engineering ethics and sustainable development. Students will be given discussion board questions and assignments to gain practice with ethical decision-making, to gain ethical knowledge and to have more experience and resources to improve ethical decision-making within engineering.

Academic Integrity Note: A note about plagiarism: Students should be aware that plagiarism will not be tolerated in this class. Plagiarism entails appropriation of passages, words and phrases without credit, appropriation of both main and supporting ideas without credit, and paraphrasing without credit. Plagiarism also includes submitting a paper written by someone else. Ethical research requires that you properly document the sources you use. Even when you do not quote directly from another work, if reading that source contributed to the ideas presented in your paper, you should give the authors proper credit. If you have questions about how to cite your sources appropriately, please purchase a reference guide to writing styles at the Bookstore/Online

Course Readings – All readings will be posted in the MyCourse Folder. No textbooks are required for purchase.

Course Grading - Grading is based on responses to discussion board questions (25%), attendance for in-class presentations (25%) and five assignments (10% each = 50%)

Class Schedule – Each module has a required time period for you to read through required materials and do the assignment

**Module One – Tuesday February 4, 2014 “Overview of Ethics and Engineering Ethics” (2.5 hours)
Time Period for Response: February 5 – February 17 (11:59 pm)**

This first module introduces students to meaning of ethics and the need for ethical reasoning in engineering.

Readings Required:

File - Module One Instructions (on-line),

Powerpoints: Overview of Ethics, Engineering Ethics, and Ethical Theories Folder (Liberal-Individualism, Utilitarianism/Consequentialism and Deontology)

Journal Articles:

- (1) Lang, Erin R ., S.M.ASCE “Applying Ethics to Engineers”. Journal of Professional Issues in Engineering Education and Practice, ASCE/ July 2003, pp: 134-135
- (2) **Read for Assignment:** Richard A. Burgess • Michael Davis • Marilyn A. Dyrud • Joseph R. Herkert • Rachelle D. Hollander • Lisa Newton • Michael S. Pritchard • P. Arne Vesilind” Engineering Ethics: Looking Back and Looking Forward” Sci Eng Ethics (2013) 19:1395–1404

**Module Two – February 18, 2014. “Professional and Research Integrity” (2.5 hours)
Time Period for Response: February 19 – March 3, 2014 (11:59 pm)**

Issues in research integrity cover scientific misconduct: falsification of data, fabrication of data, plagiarism, unethical treatment of research subjects, and failure to disclose conflicts of interest. In engineering ethics, professional ethics will cover issues fraud, corruption, mismanagement, poor product design, deliberate design faults or and harms from engineering projects/products.

Readings Required:

File - Module Two Instructions/Lecture Notes (on-line),

Powerpoint – Research Integrity and Professional Integrity for Engineers

Journal Articles:

- (1) Harris, Charles E. The Good Engineer: Giving Virtue its Due in Engineering Ethics. Sci Eng Ethics (2008) 14:153–164
- (2) Sovacool, Benjamin .Exploring Scientific Misconduct: Isolated Individuals, Impure Institutions, or an Inevitable Idiom of Modern Science? Bioethical Inquiry (2008) 5:271–282
- (3) Parrish, Debra M. Scientific Misconduct and Findings Against Graduate and Medical Students. *Science and Engineering Ethics* (2004) **10**, 483-491

Module Three – Tuesday, March 4, 2013. Protections of Human –Animal Subjects (3 hours)
Time Period for Response: March 5 – March 24, 2014 (11:59 pm)

This module covers “The Common Rule/Common Morality” which mandates human subjects research protections. Students will be introduced to the UMASS Institutional Review Board with an overview of their requirements. An overview of Group and Cultural Protections-including vulnerable groups is included.. Another section will cover animal protection

Readings Required :

File - Module Three Instructions/Lecture Notes (in class and on-line),

Powerpoint – “NEEP Common Morality for Engineers” and “Informed Consent with Cultural Considerations”

Journal Articles:

- (1) Rabins, MJ and CE Harris.1997. The Ethics of Modelling. Control Engin Practice, v. 3, #4
- (2) Hastings Center Report. The Tuskegee Legacy.Nov/Dec 1992. V. 22 I. 6, p.38

Choose One of These Most Related to Your Studies:

- (3) Sieber, Joan. 2001. Protecting Researchers, Employees and Researchers: Implications for Software Engineering. *Empirical Software Engineering*. V. 6. I. 329, # 341.
- (4) Tindana, Paulina, Susan Bull, Lucas, Amengo, Etego et al. Seeking consent to genetic and genomic research in a rural Ghanaian setting: A qualitative study of the MalariaGEN experience. *BMC Medical Ethics* 2012, 13:15

Module Four –March 25, 2014 - Data Management and Intellectual Property Rights (2.5 Hours)
Time Period for Response: March 26 – April 7, 2014 (11:59 pm)

In this module, topics in patent and software ownership issues will be covered. International property rights, pharmaceutical patent issues and other relevant topics will be covered.

File - Module Four Instructions/Lecture Notes (in class and on-line),

Powerpoint – Powerpoint “Issues in Software Proprietary Rights” and Intellectual Property Rights – International Conventions and Challenges”

Readings

http://www.nytimes.com/2013/12/30/health/indias-efforts-to-aid-poor-worry-drugmakers.html?hp&_r=0

Journal Articles:

Sterckz, S. (2004). “Patents and Access to Drugs in Developing Countries: An Ethical Analysis.” *Developing World Bioethics* 4: 1471-8731

Gotterbarn, D. -- The ethics of software development project management; Chapter in Ward, T. and S. Rogerson. 2004. *Computer ethics and professional responsibility* Malden, MA : Blackwell Pu

Module Five – Sustainability and Engineering Ethics – (3 hours)

Time Period for Response: April 8 – April 29, 2014 (11:59 pm)

This module will cover an overview of sustainability, current topics in engineering ethics regarding sustainability – i.e. adaptive design, green technologies, other appropriate topics in sustainability planning (economics, environment and equity). Environmental justice and community-based management topics in engineering and sustainability also will be reviewed.

File - Module Five Instructions/Lecture Notes (in class and on-line),

Powerpoint Reading – Powerpoints “Global Efforts for Sustainable Development” and “Mainstream Sustainable Development” Also: “CBPR and Environmental Justice”, “Cultural Competence”

Journal Articles:

Manion, Mark. Ethics, Engineering and Sustainable Development. *IEEE Technology and Society Magazine, Fall 2002*

Pereira, Tony. (2009). “Sustainability: An integral engineering design approach,” *Renewable and Sustainable Energy Reviews* 13:1133-1137

Arnold, Tony. “Planning for Environmental Justice”. *Planning & Environmental Law*; Mar 2007; 59, 3; ProQuest Business Collection