

***Please note that this document provides only core course information.
A complete syllabus will be available on Canvas to enrolled students.
There is no required textbook for this class.***

**“Social and Ethical Implications of Engineering”
Fall 2018 - LEAP 1501 – Sections 2, 3 and 7; MWF and Section 11; TH
[Social Science Foundation, Fulfills ABET criteria]
First Semester of Engineering Sequence for General Education**

Course Instructor

Seetha V. Veeraghanta, Ph.D.

158 Sill Center

801-585-0612

Office Hours: TH 8:45am–9:45am or by appointment

Library Instructors

Adriana Parker

Alfred Mowdood

Office Hours: By appointment only

Student Success Advocate

Lisa Lewis

Sill Center

385-227-2309

Peer Advisors

Peer Advisors	Section	Day/Time	Class Room	Phone	Email
TBA	2	8:35-9:25	WEB 1248		
TBA	3	9:40-10:30	WEB L114		
TBA	4	10:45-11:35	WEB L 114		
TBA	11	10:45-12:05	HPR N 225		

Engineering-LEAP [E-LEAP] Course Description

“Social and Ethical Implications of Engineering,” LEAP 1501, provides you with an understanding of the role of ethics in the engineering profession by focusing on specific

issues set out by the Accreditation Board for Engineering and Technology [ABET]¹: adhering to “engineering standards and realistic constraints - economic, environmental, sustainability, ethical, health and safety, social and economic” and “an understanding of professional and ethical responsibility” (General Criteria 3. Student Outcomes: (c), (f), (e), (h), (i) and (j) respectively, Criteria for Accrediting Engineering Programs 2016-2017.)

This course prepares you to critically understand and appreciate the social and ethical implications of engineering and technology within the broader context of local and global societies and communities. It is through the help of critical readings/articles/essays and case studies that you will learn to identify these impacts. You will identify and understand professional and ethical responsibilities based on codes of ethics statements from discipline specific professional organizations and societies. You will study a few cases of engineering failures in order to integrate concepts of risk analysis into your discussion of ethics and professional responsibilities, especially as these failures relate to public health, safety, and whistle blowing. Central to the discussions of ethics and professionalism, are the *Fourteen Grand Challenges for Engineering in 21st Century*², articulated by National Academy of Engineering. This course offers you an opportunity to understand the import of these fourteen challenges within the purview of social, ethical and policy discourses of technological advances and uses in the local and global settings.

In order to understand the role of the engineer in local, national, and global settings, you will begin by asking:

- What is a society or community? How do engineers define a professional society? What is the purpose of professional engineering societies?
- How can engineers determine what is ethical while making decisions within different communities? Are traditional philosophical concepts about ethics applicable to engineering codes of ethics, or are there other ways to think about engineering ethics?
- What are some of the major questions and problems about communities studied by social scientists? What can engineers learn from social scientists and implement in dealing with other engineers, with corporations or government agencies, and with the public?
- How do social scientists study human behavior and institutions? What should engineers know about social and organizational theory?
- What role do social scientists play in our society in influencing public debate and public policy? How does this relate to the role of engineers as citizens and as technical advisors in shaping progress or changes in technology?
- How do social scientists and engineers analyze and respond to issues of globalization?

¹ <http://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2016-2017/-outcomes>

² <http://www.engineeringchallenges.org/challenges.aspx>

To understand the impact of engineering solutions in global and societal contexts, you will study concepts of local and global sustainability. You will examine the notion of **sustainable development** from the practicing engineer's perspective and ethical implications of issues such as globalization and rapid growth of information technology, especially within the context of grand challenges. You will explore your discipline specific discourse on sustainability and ultimately present your findings as a culmination of your semester-long learning. You will receive detailed instruction and guidance on how to present professionally.

Learning objectives for LEAP 1501

*Essential Learning Objectives addressed by this course (these have been adopted by the Utah State Board of Regents as important objectives to be fulfilled by general education classes):
Acquiring intellectual and practical skills including:*

- *Critical and creative thinking*
- *Information literacy*
- *Teamwork and problem solving*

At the end of the semester you should be able to

1. Assess the social and ethical implications of creation and constructions of technology and its uses in the United States, in other nations, and in a global setting by using social science methods of inquiry
2. Acquaint yourself with the LEAP learning community, one in which students know each other, the E-LEAP faculty members, peer mentors, and the College of Engineering faculty
3. Acquire a more sophisticated knowledge of library technologies
 - a. By being introduced to databases in the social sciences, applied sciences and engineering
 - b. By being introduced to research methodologies specific to their discipline
 - c. By learning how to evaluate internet sources
4. Develop sophisticated writing and oral communication strategies which allow the student to:
 - a. Demonstrate critical thinking skills in crafting written and oral assignments
 - b. Analyze professional communication skills
 - c. Assess levels of technical expertise in audiences
 - d. Use quantitative information in visual aids such as graphs and charts
 - e. Integrate library resources into a final, team-based research project
5. Learn team building skills
 - a. By practicing leadership skills in teams
 - b. By negotiating task assignments
 - c. By evaluating the outcomes of team projects
6. Explore a variety of campus activities and organizations in order to become part of the larger University community

Required Course Materials

Please note that this list is subject to change with notice. If I find a relevant or a useful article/reading I reserve the right to include that reading as part of your required reading during the semester.

There is no one required text for the class. All the readings are available online on Canvas as pdf documents. Links to video recordings are available on Canvas as well; you are required to login using your UNID and password. You will be required to watch the video during class time, unless otherwise advised.

1. D. Metlay, "How social science informs engineering practice," *The bridge: Linking engineering and society*, National Academy of Sciences, Fall 2012, pp. 3-4.
2. J. M. Wetmore, "The value of the social sciences for maximizing the public benefits of engineering," *The bridge: Linking engineering and society*, National Academy of Sciences, Fall 2012, pp. 40-45.
3. R. J. Whelchel, "Is technology neutral," *IEEE Technology and Society Magazine*, v 5, no. 4, pp.3-8, December. 1986.
4. J. M. Wetmore, "Amish technology: Reinforcing values and building community," *IEEE Technology and Society Magazine*, pp.10-21, Summer. 2007.
5. E. R. Babbie, "An introduction to inquiry," in *The Practice of Social Research*, 8th Ed. Belmont C.A: Wadsworth Publishing Co., 1998 pp.14-40.
6. E. R. Babbie, "The nature of causation" in *The Practice of Social Research*, 8th Ed. Belmont C.A: Wadsworth Publishing Co., 1998 pp.68-85.
7. World Nuclear Association, "Safety of nuclear reactors," *World Nuclear Association*, March 2001 [online]. Available <http://www.world-nuclear.org/info/Safety-and-Security/Safety-of-Plants/Safety-of-Nuclear-Power-Reactors/>. [Accessed August 20, 2015]
8. D. Murphy-Dudley, "Exportation of risk: The case of Bhopal" *Online Ethics Center for Engineering*, 4/7/2006 [online]. Available <http://www.onlineethics.org/Resources/Cases/Bhopal.aspx>. [Accessed August 15, 2015].
9. T. Donaldson. "The ethics of global risk," *IEEE Technology and Society Magazine*, v 5, no 2, pp.17-21, June. 1986.
10. H. Collins and T. Pinch. "The naked launch: Assigning blame for the Challenger explosion," in *Technology and Society: Building Our Sociotechnical Future*, D. G. Johnson and J. M. Wetmore, Eds. Cambridge, Massachusetts: The MIT Press, 2009. pp. 369-388.
11. J. R. Herkert. "Engineering and sustainable development," in *Social, Ethical and Policy Implications of Engineering*, J. R. Herkert, Eds. Piscataway, New Jersey: IEEE Press, 2000. pp. 215-219.
12. S. Beder. "The role of technology in sustainable development," *IEEE Technology and Society Magazine*, v 13, no 4, pp.14-19, Winter. 1994/1995.
13. M. Specter, "Big Foot. In measuring carbon emissions, it's easy to confuse morality and science," *The New Yorker*, 25 February 2008. [Online]. Available: http://www.graham.umich.edu/pdf/big-foot_tny_2-25-08.pdf. [Accessed: 15 August 2012].

14. P. T. Anastas and J. B. Zimmerman. "Design through the 12 principles green engineering," *Environmental Science and Technology*, v 37, no5, 2003, pp.94A-101A.
15. S. B. Young and W. H. Venderburg. "A materials life cycle framework for preventive engineering," *IEEE Technology and Society Magazine*, v 11, no 3, pp.26-31, Fall. 1992.
16. B. C. Field. "Environmental policy: Concepts and issues," in *Environmental Policy: An Introduction*, Long Grove: Waveland Press, Inc. 2007, pp. 3-16.

Audiovisual Materials Used in Class

1. C. Gazit and E. Steward, Writer and Director, *Meltdown at Three Mile Island*. [Video recording]. Alexandria V. A.: PBS Home Video, 1999.
2. Longul, W., Nakai, Akihiko, Suzuki, Akio, & Kanopy. *Meltdown*. [Video recording] San Francisco, California, USA : Kanopy Streaming. 2014.
3. L. Tracey, P. Raymont and H. Crooks., Writer and Producer. *Bhopal: The Search for Justice* [Video recording]. Montreal: National Film Board of Canada and White Pine Pictures, 2004.
4. T. Mulholland, Writer, S. Everett and R. Burke-Ward, Directors. *Challenger: The Untold Story, Parts 6&7*. National Geographic, 2006. [online] Available: <https://www.youtube.com/watch?v=qmViyNllpls>.
5. 4 Learning, Films for the Humanities & Sciences, and Films Media Group. *Life Cycle Assessment* [Video recording]. New York, N.Y.: Films Media Group, 2011.

Whatever reading is listed for a particular day should be done BEFORE you come to class on that day.

Assignments³ and Grades	Points
Short Assignments	70
<i>Homework assignments</i>	35
<i>Library quizzes/Assignments</i>	25
<i>Mandatory attendance credit</i>	10
Interview with an Engineer - Newsletter	15
Midterm Exam	40
Student conference presentation	175
<i>Team Memo 1: Articulate research topic/Research proposal</i>	10
<i>Team Memo 2: Explain Science and Technology; Industry connection</i>	25
<i>Team Memo 3: Evaluate technology and explain sustainability connection</i>	25
<i>Team Memo 4: Explain Ethics and policy implication</i>	10
<i>Mandatory meeting with PA with Presentation</i>	5
<i>PowerPoint Presentations - Consultations with Instructor</i>	20
<i>Presentation evaluations</i>	10
<i>Team presentations [30 min. max.]</i>	50
<i>Individual Memo/Report</i>	20

³ Assignments, their values and due dates are subject to change with notice.

Total

300

Grades are assigned by points and percentages only.

Percentages	Letter Grade
94% and above	A
90-93%	A-
87-89%	B+
84-86%	B
80-83%	B-
77-79%	C+
74-76%	C
70-73%	C-
67-69%	D+
64-66%	D
60-63%	D-
Below 60%	E

Assignments

Late assignments will not be accepted; they cannot be made up.

- Team assignments are precisely that – *team* assignments. By definition they demand that a team collectively invests effort and submits the assignment for a grade. **If you miss a team meeting in-class and/or a library class, you will lose one letter grade on that corresponding team assignment.** You can find all mandatory attendance days listed on the course schedule.
- You must attend all five-library sessions and must contribute to your team research project to receive credit. Library sessions are designed to aid and assist you in successfully completing your team research project. **Attendance at library classes is mandatory as are teamwork class sessions. If you miss a library session, you will be ineligible to make up the library quiz/assignment assigned for that class.**

Paper Responses and other major assignments

- Directions for major assignments (interview, papers, student conference, and final report) will be distributed in written form and available on Canvas after they are explained in class.
- Please note: I do not accept late major assignments. Unless you make prior arrangements; an assignment left in my (E)mailbox is not on time, even if it is there on the assigned day.
- **Citation style used during fall semester is IEEE. You may find useful links on Canvas (module) to help you with this style.**

Extra Credit Points

You may earn up to five (5) extra credit points during the semester, if you attend/participate in any of the following:

- Any **one engineering** activity and
- Any **two LEAP** activities and
- Meet your Student Success Advocate for a consultation and earn a point.

To receive the credit for the options listed above, please write a 250-word report on the activity – *What, When, Where, Who, Why and So what* – and submit your write-up on Canvas. The last date for submission to receive credit is November 21, 2018. Note that you are not required to provide a write up if you meet your Student Success Advocate (Lisa Lewis).

LEAP 1060: To receive credit for LEAP 1060, “Methods and Technologies for Library Research,” a 1-unit course you need to attend all ten-library instruction sessions during 2018-2019 academic year [5 during fall 2018 and 5 during spring 2019 semesters] and get a passing grade for all ten quizzes/assignments. You will be eligible for this credit if you continue with E-LEAP in the Spring-2019 semester. We will provide you with more information as we approach Spring-19 semester registration.

Canvas: We will be using Canvas to promote discussion and learning. We will post this syllabus on Canvas, along with your grades, assignments and announcements. You are required to submit your assignments to Canvas by the due date/time. Please note that I will NOT be handing out paper copies of assignments. All assignments will be posted on Canvas and available electronically. In addition, you will maintain contact with your team for the final project by posting to your team's discussion topic, and you can access your grades and get copies of the major assignments after they have been distributed in class.

Note that participation and use of Canvas is required for this course. Log in on a regular basis to check for postings from the Peer Advisor and me.

Please note: Canvas is a public space and is owned by the University of Utah. When you are posting responses there, please follow commonly accepted rules of decorum and courtesy as you would in the classroom while responding to questions and interacting with other students, the peer advisor and the instructor.

Classroom Policies

Reading: Reading assignments will average about 20- 50 pages for many class periods. Because we have so much material to discuss in any given class period, and class will consist largely of discussion rather than lecture, you must come prepared by having done the reading in a thoughtful, responsive manner. Read the texts with critical skepticism, i.e., to identify the main ideas presented, to weigh and evaluate these ideas with an open mind, and to be prepared to share your responses about what you've read.

Attendance: I expect regular, full-time, on time class attendance and participation. Note that attendance is mandatory on days:

- **You have library instruction**
- **You work in teams in class**
- **And any other days that I may deem fit. You will be informed ahead of time before a class period is scheduled as mandatory.**
- **Note that the dates of team presentations will be drawn on Nov 18th. If you miss your team's presentation you will forfeit (read relinquish) 50 points towards your presentation and report. Traveling on these days is not encouraged.**

These days are indicated on the course schedule. Missing these classes would entail a loss in a letter grade on the corresponding assignment and repeated absences will result in your loss of a team membership and thereby final presentation as well.

If you make a serious commitment to doing five things, you can succeed in this class.

1. You cannot fulfill the requirements for the class unless you attend regularly
2. Be on time. Excessive tardiness is bad etiquette in a university class.
3. Come to class ready to participate. *I am not a TV and you are not a sponge.* A class such as this depends on your contribution to discussion. You cannot contribute without doing the reading on schedule or before.
4. Be willing to ask questions when necessary. There is no such thing as a "dumb question".
5. Refer to the syllabus, often you will find that the answer/information you seek is already answered in the syllabus. ***The syllabus is your friend.***

The above paragraph means that you are an active participant in class. For me, that precludes your multitasking. Online games, shopping, Facebook, Twitter are not appropriate activities during a college class.

Plagiarism: Claiming or suggesting that words or ideas of others are your own is a form of cheating. The University's policy on cheating is clear: plagiarism is appropriation of any other person's work and the unacknowledged incorporation of that work in one's own work offered for credit." It is theft. Punishment for plagiarism is an automatic NC [no credit for the course] and further disciplinary action may be taken.

Contacting the instructor or peer advisor

My office hours and office location are listed on the first page of this syllabus. Just come to see me to make an appointment if my office hours are not convenient. I look forward to meeting with you if you have any questions or just want to come by to share some additional ideas about the text or the discussions. Your peer advisor will give you a separate sheet with contact information.

Reasonable accommodation: Read the following statement and, if it applies to you, please visit the University's Center for Disability Services, 162 Student Union, or contact them at 581 5020 for information on how they can help you.

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the instructor and to the Center for Disability Services, 162 Olpin Union Building, 581 5020 (V/TDD) to make arrangements for accommodations. All printed information for this course can be made available in alternative format with prior notification to the Center for Disability Services.

Addressing Sexual Misconduct

Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).