Course Title: EE 180: Engineering Ethics and Leadership

Class Information: Spring 2020
Class time: Section A: 1:15-2:05 R
Location: Votey 229

Instructor Information: Dr. James Kay Votey 373
Phone: (802) 656-0734
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Office Hours: Monday 3:30 to 4:30 Thursday 4:15 to 5:15

Prerequisite: Minimum Junior Standing

Course Description: Rights and responsibilities in engineering practice and research. Case studies related to engineering ethics. Ethics and professional practice as related to professional licensure. Development of individual leadership abilities. Team-based development of written reports and oral presentations. Prerequisite: Minimum Junior standing.

Course Objectives:
1. Understand the fundamental ethical responsibilities of engineers.
2. Understand the necessary processes, procedures and culture required to ensure safety of engineering designs and operations.
3. Gain sophistication in analyzing ethical situations that arise in engineering practice through discussion and analysis of case studies.
4. Understand the fundamental rights and responsibilities regarding intellectual property.
5. Understand an engineer's responsibility to the environment.
6. Understand the fundamentals of responsible authorship and credit in engineering and scientific research.
7. Understand the basic tools used for risk assessment in the engineering field.
8. Understand a leader's role in an engineering environment, both for formal and informal leaders.

**Course
Culture:**   Respect yourself and all others. I can't work on a problem or
                issue with the class if I do not know about it, so please let me
                know of any issues that come up.

Text: Robert McGinn, The Ethical Engineer, contemporary
                concepts and cases, Princeton University press, 2018.

                Caroline Whitbeck, Ethics in Engineering Practice and
                Research, second edition, Cambridge University Press, 2011

                Students are expected to acquire the texts in an ethical
                manner, respecting the intellectual property rights of the
                authors.

Grading: Participation and reading assignments: 65%
                Papers (2 to 3): 35%

Topics: 1. Fundamental ethical responsibilities of engineers
                2. Case studies of engineering failures resulting in loss of life
                   or property
                3. Knowledge workers and intellectual property
                4. Risk management, assessment and engineering safety
                5. Engineering leadership
                6. Engineering and the environment

General:

                The instructor posts all lecture notes, assignments, solutions,
                and additional material at the Blackboard (Bb) site for this
                class. This can be found at: https://bb.uvm.edu

                Much of your grade will be based on classroom participation,
                which will require prior reading of the text. There will be
                some blackboard exercises assigned to help students read the
                assignments critically. All students will be asked to lead
                discussions in class at least once per the term. In some cases a
                team will lead the discussion. One week's notice will be given
                to allow the student to prepare.

Two to three papers will be assigned to allow students to analyze and communicate thoughts on the topics discussed. Format and content for the papers will be provided at the time of the assignment.

Attendance: Attendance is a critical aspect of this course. Students are expected to attend all class meetings. Note that attendance/participation is a large part of the course grade. The instructor should be contacted prior to any absences. If an absence is approved the instructor will provide the student with an out of class assignment to substitute for the material covered during the class period.

Academic Integrity: Students are expected to behave in an ethical fashion. This includes proper citations in written work, and respect for the intellectual property of others. UVM's policy on academic integrity is clearly defined and can be found at http://www.uvm.edu/~uvmppg/ppg/student/acadintegrity.pdf

ADA: In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact SAS, the office of Disability Services on campus. SAS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated to faculty in an accommodation letter. All students are strongly encouraged to meet with their faculty to discuss the accommodations they plan to use in each course. A student's accommodation letter lists those accommodations that will not be implemented until the student meets with their faculty to create a plan. Please visit the following site for contact information. www.uvm.edu/academicsuccess/student_accessibility_services

Religious Holidays: Students have the right to practice the religion of their choice. Students should submit in writing to the instructor by the end of the second full week of classes their documented religious holiday schedule for the semester. An arrangement could then be made to make up the missed work.

Alcohol/Cannabis: As a faculty member, I want you to get the most you can out of this course. You play a crucial role in your education and in your readiness to learn and fully engage with the course

material. It is important to note that alcohol and cannabis have no place in an academic environment. They can seriously impair your ability to learn and retain information not only in the moment you may be using, but up to 48 hours or more afterwards. It is my expectation that you will do everything you can to optimize your learning and to fully participate in this course.

ABET Matrix:
0 - little or no contribution
1 - moderate contribution
2 - high level of contribution

• *Outcome (1)*: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
Contribution: 0

• *Outcome (2)*: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
Contribution: 1

• *Outcome (3)*: An ability to communicate effectively with a range of audiences.
Contribution: 1

• *Outcome (4)*: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
Contribution: 2

• *Outcome (5)*: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
Contribution: 1

• *Outcome (6)*: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
Contribution: 1

• *Outcome (7)*: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
Contribution: 0

• *EE Criterion (A)*: The curriculum must include probability and statistics, including applications appropriate to the program name; mathematics through differential and integral calculus; sciences (defined as biological, chemical, or physical science); and engineering topics (including computing science) necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

Contribution: 0

- *EE Criterion (B)*: The curriculum for programs containing the modifier "electrical," "electronic(s)," "communication(s)," or "telecommunication(s)" in the title must include advanced mathematics, such as differential equations, linear algebra, complex variables, and discrete mathematics.

Contribution: 0