

Ethics Assignment

DUE DATE: Tuesday, December 11, 2012.

LEARNING OUTCOMES:

Having successfully completed this assignment you will have demonstrated the ability to do each of the following:

- I. Critically analyze how value judgments are embedded in the design process
- II. Show how design solutions are shaped by ethical considerations
- III. Recognize how an explicit treatment of ethical considerations in the design process satisfies different aspects of the IEEE Code.

The latter outcome implies you will have read and understood the entire IEEE Code.

INSTRUCTIONS: Students may work together discussing various aspects of the assignment. However, each student is to turn-in their own written report. No written material should be copied from other team members or outside sources, i.e., no plagiarism. Students are expected to fulfill all requirements in their own written words and with very limited recourse to quotes. NOTE: Even if you paraphrase from another source you must reference it.

PAGE LENGTH: As many pages as you need, but the length should be at least 5 pages. (A page is defined as approximately 350 words. This is based on a Times New Roman, 12pt. font, 1.5 line spacing, and 1 inch margins.) Anything less and you probably have not fully answered the questions.

SUBMISSION: Submit both a hard copy and electronic version to Dr. Austin and Steve Norton (2425 A.V. Williams, norton@ece.umd.edu).

1. Project Overview

- Provide a detailed, minimum, one-page description of your design project.
- As part of this description you should enumerate the various design criteria for your project.

2. Ethical Implications Inherent in the Design

- Identify some aspect of your design having a significant ethical implication.
 - This is not to be confused with an ethical aspect of the design process. For example, being honest in reporting your results is an ethical aspect of the process, but it is not an ethical feature of the artifact you are designing.
 - If your set of design criteria does not already contain a performance variable that explicitly deals with some ethical consideration then expand the set to so include one. This is absolutely critical to this assignment.
 - Keep in mind that one design criterion may have an ethical implication in one situation but not another.
- Once you have identified the design criterion with the most significant ethical implication, you need to explain, in detail what the implication is and why it is important to explicitly deal with it.
 - Again, this may be quite contextual and require you to expand on the circumstances.

- In your description, you must state explicitly how the design criterion or criteria will change depending on how one responds to the ethical concern.
- Use at least one concrete example to illustrate your point.

EXAMPLE# 1

- You are designing a display information system (DIS) that air traffic controllers rely on for information about arriving and departing flights, weather conditions, equipment status, and more.
- Since humans are limited in their ability to process auditory and visual stimuli, there will be specific design constraints on the system.
- A simple design feature is to make visual displays robust with respect to different types of color blindness. (NOTE: Individuals with certain types of color blindness can be licensed as air traffic controllers.)

EXAMPLE#2

- You are designing an amplifier that can be used in an implantable hearing device. Do the materials used make any difference?
- If this is an experimental hearing aid or probe that will be reused, how careful do you have to be about material permeability for sterilization purposes?
- If you decide sterilization is important for the health of test subjects (as most would), is this made more difficult given the type of materials employed? If so and a change in material is required, how will this change the device performance. Remember, there will generally be trade-offs involved in any decision you make.

3. Optimization of Design

- Explain the specific trade-off necessitated in the design process to “adequately” address the concerns identified in (2).
- Making such decisions will ultimately result in a technological artifact or process that actually embodies your value judgments.

4. Embedded Values and Ethical Responsibility

- Explain how the explicit treatment of the ethical aspect of the design criterion identified in (2) and (3) helps you fulfill some aspect of the IEEE Code of Ethics.
- You may refer to more than one element in the code, but you must clearly address at least one element in your answer and tie your explanation to some implication or implications of your project. Again, use concrete examples and quote the relevant parts of the Code. Your answer should be at least one page.

5. The Design Process and Ethical Responsibility

- Consider various aspects of the design process that might be of concern to a professional engineer and why. Reference at least three relevant elements of the IEEE Code in your answer.
 - It may be that under certain circumstances you are not able to “adequately” address the concerns you identified as having significant ethical implications. This may be due to time constraints, resources, etc. Explain these issues in detail and what a responsible engineering would do in such a situation.