Due before 11:59 PM on Friday 12 December 2014

Instructions

- Questions 2 and 4 refer to articles that are available on the Internet. In case you have difficulty opening these articles from the URLs in this exam document, hard copies will be available from links on the exam page of the public web site for ME 370.
  http://web.cecs.pdx.edu/~gerry/class/ME370/exams/
- The work you submit must be your own effort without assistance from other people, whether they are students in the class or not. If you have questions about the exam, contact me via email to gerry@pdx.edu.
- You may consult external resources including books, articles and the internet. You must cite those resources if you use facts or ideas from those resources in your answers. Points may be deducted if you use specialized information that is not common knowledge without giving a citation for the source of that information.

  Here is a simple rule: if you had to look up information that you didn't already know, cite the source. Another simple rule: if you have information from your prior reading that your classmates (or instructor!) might not be expected to know, cite the source. Use of credible sources increases the credibility of our arguments. It also provides a way for others to find original information and dig deeper if they want.
- The responses to the questions do not need to be long. A few sentences should be sufficient. Answers will not be penalized for being too long provided that the answers are pertinent to the question and the writing is concise. Verbose answers, or answers with irrelevant information may be penalized. Please use common sense.
- Answer each question on the exam with complete sentences using proper spelling, punctuation and grammar. Points may be deducted for egregiously unprofessional writing, bad grammar, spelling mistakes, etc. It should not be hard to avoid these penalties since most word processors have a spell checkers and grammar checkers. Your prose does not need to be perfect.
- Some questions require you to express an opinion or recommendation. *As long as the opinion or recommendation is reasonable*, the points awarded to your answer will depend on how well you support your opinion or recommendation with information from the problem statement or external resources. In other words, providing a rational and persuasive answer is more important than the position you take on these issues.
- Check the discussion topic for the final exam on the D2L web site. I will post any general announcements there. *Any information on that discussion forum is considered to be part of this exam*. Students will not be allowed to post information to the forum. Rather, send your questions to me, and if I think they are of general interest, I will post the answers to the forum. If you have questions about where to find the forum or how to read it, contact me via email at gerry@pdx.edu.
- Any update to this exam document, e.g. correction of typos or text additions, will be indicated by an increase in the version number in the document footer. Any corrections or additions to the text will appear in red on the modified exam document.
- Your solutions must be submitted as a *single* word-processing document in either MS Word, PDF or RTF. MS Word format is preferred. Solutions must be uploaded to the D2L drop box before 11:59 PM on Friday, 12 December 2014.

1. (15 points) Ajax wheelbarrow company has a detailed accounting of the environmental impact of its products. Ajax can document the energy inputs and environmental by-products for all the materials that go into their wheelbarrows. Ajax also tracks energy consumption and waste during manufacturing.
   a. In the sustainability literature, what term (or terms) is used to describe the type of environmental accounting done by Ajax?
   b. What additional steps or analysis do you recommend to make Ajax's environmental accounting even more complete?
   c. Apart from any regulatory compliance, public relations or marketing benefits, how can Ajax's environmental accounting be of benefit to Ajax's business?

2. (15 points) For background to this question read the blog post "*The 3 Laws of Ed-Tech Robotics*" by Audrey Watters

   http://hackeducation.com/2013/04/29/the-3-laws-of-ed-tech-robotics-tedxnyed/
   a. List one advantage and one disadvantage to automated grading of essays.
   b. Suppose automated grading software was available and students could voluntarily submit multiple drafts of their essays before those essays were graded by a human. What do you suppose would be Ms. Watters' opinion of that usage of automated grading software?
   c. Consider the use of automatic plagiarism detection software such as PlagTracker.com, turnitin.com, or moss <http://theory.stanford.edu/~aiken/moss/>. In your opinion, is automated plagiarism detection software equivalent to automated grading of essays? Would you recommend that Recktenwald use one of these services in ME 370? Why or why not?

3. (15 points) Bob is an engineer working for large company X. Bob's friend Jane is also an engineer who works a different division of X. Over lunch one day Jane is describing a new product that X is planning to introduce in the next few months. Jane confides that some of the early prototypes appeared to have some safety issues, but those issues have been resolved. However, Jane wants to know what she should do with the test data from those early prototypes. Jane's manager told Jane to shred all records from the early tests.

   Bob says, "well, since the new designs don't have that safety flaw, you should be OK to delete the old data." Bob continues, "I can't keep all my old records around. It's good practice to clear out the old files."

   Jane replies, "but we're not done testing and doing product development. What if some later version shows that same or similar safety flaw? Shouldn't we keep the old data in case we need to use it to improve our design?"
   a. Does Jane have an ethical dilemma? If so, what is it? If not, explain why not.
   b. What would you advise Jane to do? Use the ASME Code for guidance in your answer.

4. (15 points) Read the article by James Surowiecki, "Spy vs. Spy" in the *New Yorker*, http://www.newyorker.com/magazine/2014/06/09/spy-vs-spy-3
   a. Over the history of international industrial espionage and illegal copying of patented work, what is the common characteristic of the countries accused of stealing IP?
   b. If patenting a technology cannot prohibit it from being used illegally, what benefit is there of obtaining and attempting to enforce a patent?
   c. The article describes how Francis Cabot Lowell copied the Cartwright power loom by memorizing the plans. If the British mills had used a trade secret strategy to hide or disguise key working parts of their power looms, *and* if Francis Cabot Lowell had not been allowed to sneak into the mills, what other mode of espionage could have worked? What did the British do to prevent that other mode of espionage?