

CSC 300

Professional Responsibilities

- Instructor: Clark Savage Turner
- Office: 14-222, Phone: 756 6133
- Office Hours (tentative):
 - Monday 1:10 - 2 pm, 4:10 - 5 pm
 - Tuesday 10:10 - 11 am, 12:10 - 1 pm
 - Friday 1:10 - 2 pm
 - and by appointment
- Email: csturner@calpoly.edu
 - don't count on email (or cellphones!)
 - watch for spam filtering (use calpoly accounts)

Texts

- **Required to read:**
 - Johnson, Computer Ethics, 3d Ed., Prentice-Hall
 - Strunk and White, The Elements of Style
 - you may opt out of this if you qualify by other writing courses
- Recommended to read
 - Martin, Schinzinger, Ethics in Engineering
 - Turabian, A Manual for Writers

Participate by volunteering short reports on current issues

- Try this:
 - Go to a LUG meeting
 - Read 2600 magazine
 - Read (usenet) comp.risks
 - Peruse Slashdot
 - Read the business section of the newspaper
 - Listen to NPR
 - Bring your own work experience
 - Make friends with local hackers
 - Watch videos on You Tube
 - Play WOW

Assignment and Reading

- Review Standish Group's "Chaos Report" tonight
 - referenced on my webpage
- Look over the SE Code of Ethics
 - Linked from my webpage
 - Possible oral QUIZ in class on the code during the second week of classes.
 - You need to read and understand the major topics and some details
 - Be prepared to discuss a few in detail during class
 - We will need to KNOW this code.

Assignment and Reading (cont'd)

- Plan to read assigned papers in detail
 - take notes and look for the important points
 - why did the author write this paper?
 - what are the main points of the paper
 - what are the main arguments supporting the authors thesis?
 - why is the paper considered important even today?
 - what is the author's pedigree, position today?
 - how much is the paper cited in other works?
 - what do you find strong / weak about the paper?

Lab 1 Assignment

- Prepare 2 page obituary for yourself
 - give me a vision of what you hope to achieve in your life beyond graduation.
 - where will you live?
 - what will you be doing?
 - what will you have achieved?
 - Include a photo at the top
 - due at the end of lab on Friday, week 1
- This begins your portfolio

Prerequisites

- Prerequisites for this class (changing...)
 - CSC 307 or CSC 309
- Make sure you are on the roll,
 - and you know the drop dates
 - I do not keep track or give reminders

Look at Course Website

- Tour the website
- Note that **in-class** pronouncements have priority over web pages
 - I may announce things in class that are not on the web and may not ever make it to the web.
 - you are fully responsible for announcements made in class, even if you are not present

General Course Themes

- Review course description from catalog
- Define terms as we encounter them
 - there is a lot of ambiguity out there
 - **is this always bad?**
- Spot relationships between technical and social realms (as though they are distinct :-)
 - *communicate clearly* about it

Grading

- See website for assignment / exam details
- Goals: (How to get an A, B, C, D or F)
 - *consistently*
 - develop communication skills
 - writing effectiveness is **assumed** (spelling, grammar, clarity and style)
 - develop research skills (not wikipedia)
 - develop critical thinking (not opinion)
 - see higher implications of low level technologies
 - look at computing in a situated context
 - computer scientists have no inherent right to do CS and SE, they perform service for society (who supports them)

Grading (cont'd)

- see tradeoffs and able to make legitimate arguments for alternative designs and outcomes
- become familiar with Codes of Ethics
 - why do we have Codes?
 - how do we use a Code of Ethics?
 - are we “Professionals” - what does that mean?
- become familiar with current topics in computing ethics
 - and their social implications
- Not necessary (possible) to reach “correctness”
 - must be satisfied with rough methods for ethical analysis

Grading (cont'd)

- compare this to “correctness” for software?
 - are we any “better”?
- Perspective on grades
 - evaluation is part of life
 - but not all of it :-)

Underlying Questions and Definitions

- What is “ethics”
- What are “codes”
- Who *should* care
 - why should anyone care anyway?
- What is an “employee”
- What is a “professional”
- What is a “system” - “emergent behavior?”
- Digital vs. Continuous
- Duty to meet a “contract” or “solve a problem?”

Software / Computing

- What are YOU doing here?
 - Why do we get to do computing?
 - Who pays for this?
 - Who suffers costs / enjoys benefits?
 - Who has “authority” to direct, restrict, guide?
 - What are the issues of consequence?

Ultimate Goals for CSC 300

- You'll know the SE Code of Ethics
 - and how to use it
- Broad general knowledge of issues and tradeoffs in computing and ethics
 - familiarity and ability to argue reasonably for alternative designs
- A high quality 6000 word paper in some area of computing ethics
- CSC 300 lab reports to show ethics experience
 - developed by you in groups

Intro Cases to think about

- Final exam on professor's display
 - you are invited but unobserved
- Internet gambling program flaw
 - illegal to gamble in your state
- Avionics control systems contract
 - impossible to meet software requirements
- Wardriving and mapping to put on web

Thoughts on Analysis of Issues

- Who are the stakeholders?
 - direct and indirect
- What obligations are at stake?
 - legal, ethical, fiduciary...
 - what level of obligation is at stake?
 - professional or employee
- What are the tradeoffs made for a given solution?
 - the benefit (always?) has a cost

Thoughts regarding Case Studies

- How do we proceed?
 - Look at the undisputed relevant FACTS
 - no argument from any side: the background
 - Find the ISSUES
 - what are the questions inherent in the story?
 - How IMPORTANT are the ISSUES?
 - should anyone care?
 - List the STAKEHOLDERS and their interests
 - who are the players and their interests?

- Look at extant ARGUMENTS (what do *other rational people* think about the issues?)
 - you've not yet decided on an answer, just survey what other smart people think
- List applicable rules, laws and ethical principles
 - why are they applicable? SE Code applies?
- List TRADEOFFS made for any given solution
 - who wins, who loses, by what means?
- Analyze to come to your own solution
 - based on previous analysis and basic rules

Anatomy of a Logical Argument

- Collect general principles and rules
 - codes of ethics, general ethical principles, laws, morals, commonly held beliefs
 - use strongest forms first!
- Collect relevant facts that raise an issue, form a question from that issue
- Apply the principles or rules to the facts
- You now have an answer to the question

- Facts: Dr. Turner wrote some code for a medical linear accelerator for a Varian machine. He later did a few modifications and got it running on the AECL Therac-25 to sell to them, explaining that he “wrote this specifically for your machine.” Bugs showed up that killed patients. AECL does not want to pay Turner for his work, claiming he was unethical.

- Issue - were Turner's actions ethical?
- What rules apply? SE Code?
- One Relevant rule: SE's should not engage in deception regarding software.
- Issue - did Dr. Turner engage in deception?
 - Yes. Prove it by using the “facts” (nontrivial task?)
- Therefore, Dr. Turner's actions were unethical
 - whether he gets paid is a legal issue

- Turner “modified” code for the Therac-25, he did not write the code specifically for the machine [facts]. This is deceptive, especially since we know there are serious risks to haphazard code reuse [Parnas]. SE Code section 1.06 directs SE’s to “avoid deception” in all statements about software. Turner was deceptive in violation of the Code and his actions were therefore unethical (and led to damage to his client.)

“Correctness”

- What is “correctness” in Software Engineering?
 - meet spec?
 - “satisfy” “customer”?
 - capture a “market”?
- must be satisfied with rough methods for ethical analysis too
 - *compare this with software “formal” correctness*
 - See Leveson, Parnas, Hamlet, Knight, Kaner
 - » complete testing absolutely impossible
 - » formal proofs impractical and of limited value
 - » pointers back to “requirements” problem (validation?)

Computer “Science” ??

- Define “science”
 - consider theme central to “The Structure of Scientific Revolution” by Thomas Kuhn
 - natural science
- Sciences of the Artificial
 - “design science”
 - see Herb Simon’s work and others built on it.

Karl Popper's falsifiability criterion (epistemology)

- Any respectable scientific theory must be falsifiable, subject to showing it is untrue
 - “God is love” is not falsifiable
 - not a perjorative criteria
 - there are different ways of “knowing”
 - “The new Cal Poly IP policy explicitly favors ‘open source’” is falsifiable
 - so it can be “tested” for its truth objectively
 - just like the rules for Software Requirements