

# Midterm 1

## CSC 300

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Name: \_\_\_\_\_

Course : CSC 300 - 01

### Instructions

1. Do not put your name on individual questions, just on the top sheet, I try to grade as blind as possible :-)
2. You may use any of your notes/books for this exam. Internet search and lab workstations may be used in research and producing your exam answers. Cellphones must be turned off.
3. If handwritten, you should have enough space given on the page to answer the question adequately. If absolutely necessary, use the back of a page.
4. For True/False questions, give *a very brief* reason if you need to.
5. For short answer and essays: *clarity, conciseness* and legibility are an important part of the grade – you must be able to communicate your answers effectively.
6. As repeatedly discussed in class, essays must exhibit a good understanding of the facts, the issue, the rules and principles that apply. Alternative arguments must be made and criticism, synthesis or creativity must be used to come to your own rational conclusion. Remember, reasoning “in the air” will not suffice. Use known facts and examples to apply the rules and principles to come to a solid conclusion. (*You may radically differ with my opinion and still receive a high grade on the basis of rational and principled analysis.*)
7. Opinions are irrelevant on this exam. Credit is given only for reasoned answers supported by facts, arguments and analysis.
8. You have about 80 minutes to complete the exam. Plan your time accordingly.

question type	true/false	short answer	essays
# of questions	20	5	2
worth (%)	2 pts/ = 40	4 pts/ = 20	20 pts/ = 40
grade (%)			

total grade	%
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**TRUE/FALSE section. 20 at 2 pts each.** Circle one of the boolean values at the left for the truth value of the numbered statements below. If absolutely necessary, write a very brief reason below the statement as a justification.

- |      |       |   |
|------|-------|---|
| true | false | 1. The IEEE/ACM Software Engineering Code of Ethics (“SE Code”) requires Software Engineers to obey the law at all times.                   |
| true | false | 2. The Code, by its own declaration, does <i>not</i> apply to students or professors of software engineering.                               |
| true | false | 3. According to the Cal Poly RUP, port scanning is not a responsible use of computing resources.  |
| true | false | 4. Weyuker believes the <i>oracle problem</i> may never be completely solved.   |
| true | false | 5. A <i>normative</i> statement is one which merely describes a phenomenon.   |
| true | false | 6. If properly qualified, you could be licensed to practice as a Software Engineer by the State of California.                              |
| true | false | 7. “We should not use Java for any security-critical systems” is a normative statement.   |
| true | false | 8. “The safety-critical flag given in the Therac example was only 8 bits wide” is a descriptive statement.                                  |
| true | false | 9. The SE Code requires that software engineers report violations of Intellectual Property law that they observe during work.               |
| true | false | 10. Parnas teaches us to “fake” an ideal software design process and document it as though there were no discussion of alternative designs. |

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- true false 11. California Penal Code section 502 mandates that, as a Cal State University, Cal Poly must incorporate certain terms into its Responsible Use Policy.
- true false 12. University of California students are not subject to California Penal Code section 502.
- true false 13. Professor Turner secretly admires Professor Fisher. (hint: its true!)
- true false 14. The SE Code mainly takes a utilitarian perspective.
- true false 15. A "partial oracle" is when a tester is able to state with assurance that a result is incorrect without knowing the correct answer.
- true false 16. The SE Code requires that software engineers make significant tradeoffs available for consideration by the public.
- true false 17. Hamlet claims that reliability theories may be applied to software whenever a statistically sound "user profile" is available.
- true false 18. Hamlet believes that good processes and methods can result in "defect free software."
- true false 19. The SE Code provides for certain penalties in cases where its provisions are violated.
- true false 20. Fred Brooks thinks that changeability of human-created interfaces is an essential difficulty for software engineering.



23. Do you think that SECOE section 7.02 (also look at 7.03) conflicts with the general classroom policies regarding cooperation on homework and programming assignments? Look at both sides and explain your answer.

24. Are there sections of the SE Code you could use to support Open Sourcing software? Explain very briefly.

25. What is the fundamental problem of software testing?

**ESSAY section. 2 essays @ 20 points each.** Here I give a simple case to ponder. I want you to perform some basic ethical analysis to come to a reasoned conclusion. Clarity, conciseness, reasoning from facts, alternative arguments and rules are required. Citations to other arguments will strengthen your answer (form of citation not important as long as I can understand it and ask you for the correct form later if needed.)

26. Suppose you graduate from Cal Poly and apply for jobs. One company, Undercover Systems, is very interested, but they don't talk much about the duties they'll assign you, just that you'll be "programming" in an "interesting environment." You've just gotten married and bought a home, your mortgage payments are pretty high and your partner is home taking care of your very sick mother every day. Undercover makes you a very attractive offer and you accept, still wondering what the job is about.

Before you're hired, you are asked to sign a Nondisclosure agreement (where you agree not to speak about the job, the people who work there, or what goes on there) and told that you will work as an "information retrieval operative" where you write programs designed to covertly connect to target PC's on the internet, gather data, and send it back to the central database for analysis. This is all done without the PC owner's knowledge or consent.

You speak to your manager who assures you that the work is under contract with the US Government (but [s]he is not allowed to show you any documentation, it is secret) and that the targets are potential terrorists, so that the protection of innocent lives is at stake. You are then told to get to work right away, there are deadlines and you must perform or could receive a poor job evaluation and lower your chances for advancement.

*Answer this using general ethical principles and the SE Code. Note that parts a, b, c, d are optional, but very helpful in setting up various parts of your answer. You may answer these parts and I will consider them for partial credit, but in all cases, you must write a complete answer with analysis to part e.*

- (a.) List 5 facts that raise important ethical issues in this problem. These facts should be given in very brief phrases such as “sick children depend on income from the job” or “medical device successful cure of hundreds of lives, only 3 killed.”
- (b.) List three important issues you would consider in analyzing this problem. Number them to match with later reasoning. These should be in very brief phrases such as “is it ethical take a non-weapons related job working for the military when I am a pacifist?”
- (c.) List applicable SE Code rules and other ethical principles that apply to the each numbered issue that will help you do your analysis. At least one rule or principle per issue, probably more. Write out the rules in short phrases rather than simply the Code section number designations.
- (d.) Give me a very brief list of alternative arguments *on each issue*. (Match issue to argument.)

(e.) Analyze each issue in turn to come to one reasoned conclusion on the whole matter.



27. Suppose you write a paper extending Weyuker's analysis in her paper, "On Testing NonTestable Programs" for your CSC 300 class and you publish it in an IEEE journal. You show that testing of software still isn't anywhere near an exact science and that we, as yet, have no objective measure for the "strength" or "thoroughness" of testing. You admit that we can get a bug list that clearly helps avoid certain problems, but that is the only certain result of testing. The IEEE asks you to write some guidelines regarding the Software Engineering Code of Ethics section 3.11. You'll write guidelines involving adequacy of test documentation and you'll give very brief justification for each guideline.