

## Instructions on the Final Exam

Your final exam will be problem-centered. That should not come as a surprise. In order to lessen some of the stress I am going to give you the problems in advance. In fact your problems will be selected from the problem #4 list that I give you. Let me clarify that. You will be given a list for problem 4 and your group will choose one of these problems for the group to work on. The remaining problems (i. e., the ones that your group did not choose) will compose the problems from the final. I will specify an amount that I would like you to address and you will have the exam period to write up how you would address and solve the problems listed. Lets say for example purposes only - there were 10 problems available on problem 4 list. Your group selects one of them, which leaves 9 problems available for the final exam. Of those nine I may specify that you choose any 5 that you wish to solve. Therein, you will have all the problems that will be on the exam before hand. However, when you show up for the exam you will have to answer them based on your knowledge and study. It is not OPEN BOOK when you get to the exam period. - you will have to apply what you know from all sources. *And -please note here - I want you to cite the basis/rationale for your answer: whether you are getting the material from lectures, previous problem solving in your group, book, class discussion, handouts, etc.* This is to show you know what you are doing and why rather than just answering off the top of your head. I am allowing you the problems to help you prepare and focus your study.

Remember you will be to choose the problems you want to answer from the list. You may wish to study with your groups if that excites you or individually - whatever enhances your problem solving. The best answers to questions will be

- (1) grounded with knowledge we have learned and utilized
- (2) show creative solutions but utilize analysis of a problem given what we have discussed or read
- (3) utilize as many cited sources as possible to justify your answer. I am more interested in the quality of problem solving than I am memory but memory and learning and thinking are intimately coupled together.

Therein, some memory will be necessary. The key to learning is to transfer knowledge learned in 110 to problems that appear on the exam. *The exam is worth 25 points.* One note - obviously you can't answer the problems in the same degree of depth and information seeking as you can for the group problem 4. I realize that. But, I want you to answer then according to the best of your abilities, given your study of the problems in advance, and within the confines of the time allotted for the final exam. So use your common sense when doing the final...try to distribute your time across the problems you select. *Generally the answers will take up somewhere between a half page and a page in full (as a rule of thumb).*

Therein, the next 3 weeks are critical for your grade in IST 110 as they compose 45 points worth of your grade. Your efforts on the problem 4 and on the final exam represent a culmination of what you have learned or what you can do or should reflect a change in your thinking about IST problems and solutions as a function of taking this class.

Best on all of the final projects.

Professor McNeese

**(Go to the next page for the Final Exam list!)**

**IST 110 - 2 Problem 4 and Final Exam List****Professor Michael McNeese**

Group \_\_\_\_\_

Date \_\_\_\_\_

Please select ONE of these problems as Problem # 4 for your group. The remaining problems that you do not choose will be part of a list of questions on your final exam (which you will select a subset from). Perhaps these problems seem simple on the surface but it is your job to discover what the salient constraints, contingencies, and inherent user needs are as a basis (design rationale) for providing a high-tech information sciences and information technology design (solution space).

The following are problems /situations I would like you to think about (analyze and suggest possible solutions to) and to answer based on *putting your knowledge to use*. This means answering the problem by bringing all the knowledge, concepts, ideas to bear from a variety of class sources (lectures, group exercises, labs, requested readings, book, team problems, etc.) to generate the best problem definition - approach - solutions that you can based on what you have learned. Furthermore, you may seek various alternative solutions and paths to find creative "out of the box" approaches. I am looking for you to show me what you have learned as you apply it to real situations. Think of yourself in the role of a systems analyst providing answers to a client. Obviously, I have defined some of the problem states already but it is up to you to further identify, define, expand, and explore possible in-depth approaches and solutions. So be creative and lets see what we come up with. (Please address these problems in the same way you did problem # 2.) If you have any questions about the problem your group selects please contact me and I will advise as appropriate.

1. Using smart room technologies - propose a redesign of: a) fire station or b) a surgical suite in a hospital. What would you consider / what would you do to improve performance?

2. Using concepts from system analysis /cognitive systems engineering redesign your dorm and dorm-room using yourself as the primary user. Provide your design rationale and integrate use of new information technologies we have discussed (as appropriate).
3. You have been appointed as Chief System Analyst in charge of evaluating / improving the PSU website. Using various concepts, ideas, guidelines we have studied (1) how would you analyze the site (provide your initial impression of the site)? and (2) How you would improve the site.
4. With all the reports and incidents of school violence - there are various troubles in our middle and high schools today. Using class or class-related concepts, analyses, advanced information systems, technology, etc. please suggest potentially new envisioned solutions for this problem that address different kinds of people in the school (students, teachers, staff, etc.).
5. You have been assigned to design new information systems for emergency medical technicians and resuscitation crews who require use of an ambulance to get to mobile patients. Describe how you might use web-based computing, personal digital assistants, cell phone technology, or other advanced information technology to improve their problem solving in the field.
6. Tell me how you would apply what you have learned so far as a basis to design a HCI to an Uninhabited Air Vehicle Domain – as we discussed in class. (Assume this will be an interface involving a team 3 operators using virtual reality headsets remotely controlling a secret, advanced model airplane designed to take reconnaissance pictures of Penn State’s next opponent in football). Prioritize what you would consider in the HCI and how you might go about developing it.
7. You have been appointed the Head of Telecommunications for NASA. As part of your responsibilities you are required to make a proposal for a system that can integrate (1) web-based computing (2) a/v teleconferencing (3) virtual environments (4) avatars --to

enhance the communications, decision making, and command/control among members of the flight crew of the *International Space Station* and the ground command post (on earth). How can you explore this problem and provide effective human performance.

8. What are some of the considerations that countries (e.g., the US) should be concerned with in dealing with information warfare / information security? What are some of the targets that information warfare would focus on and how would you prevent major international events from occurring (security) and/or how would you suggest offensive information warfare be conducted?

9. Take the Napster issue – you are the lawyer arguing the case – give your statement on the social, ethical, and/or legal implications associated with use of this technology. Why/how does this affect your philosophy regarding IST or the www? Since Napster appears to dead what lies on the horizon in this area of web-based information transfer?

10. Using concepts related to human factors, HCI, HIP, or pattern recognition describe how you would analyze and advise the Supreme Court Justices on how election results or individual ballots could be interpreted for intent (to determine voter's intent). Give rationale. Why or Why not they can (or cannot) be interpreted. Point out how information sciences and technology could be used to enhance the country's voting/election process. Include in your analysis of results ideas like butterfly ballots, perception of chads, and other elements that are making the election difficult to read.

11. Remember the Feeding Robot in the movie *Modern Times* and how it went awry – If you were considering a user-centered design of a feeding robot for a disabled person that a user could assist-control-monitor remotely from a website. Tell how you might use lecture information from a) Human Information Processing or b) the Systems Thinking lecture to analyze this situation.

**(The End)**