Suggested Final Exam Preparation

As the course overview page indicates the final exam will be worth 200 points. You will have 3 hours to complete the exam. **Remember: You WILL be allowed to use the book and notes.** On the exam will be:

- **Translations, Part I** -- statements only (similar to Exercise III, Chapter 7 and Exercise I, C11) = 40pts.

- **Translations, Part II** -- one argument (similar to translation exercises in Chapters 8-10) = 20pts.

- **One truth table** (similar to Ex. III, Chapter 8) = 20pts.

- **Two Formal Proofs**: one proof from step 6 (60 pts.) and one from C11 (40 pts., similar to Ex. VII, C11). Both proofs will already be translated.

- **Application Problems** (similar to Ex. III, Chapter 1, but much easier with symbolic logic tools) = 20 pts.

To do well on this exam, you will need to understand Chapters 7-11 and understand the concepts of validity and invalidity.

To prepare for the translations you should have done all the exercises in Chapter 7 (I, II, III), Chapter 8 (IV), the translations after step 3 in Chapter 9, those after step 6 in Chapter 10, and Ex. I, C11. Then you should have looked at the answers and asked me any questions if you did not understand the answers or had something different and were not sure whether your answers were also acceptable. The best students not only do this, but take the time to create an expanded dictionary. They photocopy the dictionary on pages 313-316, and pages 478-480, and then type the English for each exercise with Word, leaving a space between each item, and then they type or write in the correct answer in the space. They put the dictionaries on top and attach the other pages. This way they have a fairly substantial portfolio of translations to study from and use as a guide to do the ones on the final exam.

Generally, throughout the semester students find the translations hard. Some will start to enjoy the formal proofs and avoid the translations because they are not as black and white as the formal proofs. Please remember though that translating is similar to learning another language, and the ONLY WAY to get good at it is practice it over and over by doing the exercises in a timely manner. Students who have not practiced via the exercises throughout the semester generally do very poorly on the final translations. Note, combined they are worth 60 pts. (30%) of the final exam total points. In the translations, part II, you will also have to figure out which statements are the premises and which one is the conclusion. We have been practicing this structuring of arguments since Chapter 2.
The truth table should be very straightforward, but please remember the discussion question related to Chapter 8. Even if you know how to construct truth tables, this ability is worthless unless you also know how to correctly tell if the argument is valid or invalid.

Note that the two formal proofs constitute 50% of the exam. Appreciating formal reasoning (the agony and the ecstasy), learning to test different trails of formal reasoning (hypothetical reasoning), and understanding the concept of formal proof are key hallmarks of the requirement Philosophy 110 satisfies. As noted in the supplement for step 6, I will be very lenient in grading your performance on these problems. You do not need to solve either problem for a good grade. Obviously to get an "A+" grade you do need to solve them, but you can get up to 90% plus points by doing a lot of quality steps that are valid and show that you know how to use the rules well. On the other hand, you will lose most of the 100pts. if you show that you still do not understand the rules and have lots of X's.

As I noted previously, the best way to get better at formal proofs is to "jump in" and try creating as many steps as you can for any of the exercises. Then share your proofs with others and/or me. This is the best way to flag or spot mistaken applications of the rules. Ideally, if you did many proofs and shared them, you would get all of the potential X's out of your system so to speak. The worse thing to do is just look at the answers without trying them yourself. That would be like trying to learn to ride a bicycle by just watching someone else do it. Students get very frustrated when they cannot solve a problem right away. We all do. But you learn the most when you work on a hard problem and get stuck. Remember also that the secret is subroutines. There are many more than those listed in the textbook. You will discover these for yourself if you gain a lot of experience getting stuck on hard problems. (Note, the best students will have not only the translation portfolio ready for the final as noted above, but they will also write down all the subroutines on several pages. These pages plus a copy of all the rules should be all you need for the final exam.)

Please remember that our UH hallmark goal is familiarity with the proof process. Even if you cannot solve proofs, you can get most of the points by doing a quality trail of symbolic reasoning with the rules, even if that trail seems to go nowhere.

The application problems are intended to be easy, provided you know the rules, can translate a little, and know the difference between a valid and invalid argument.

Here is an example of what will be on the final exam. All you have to do is tell me if the argument is valid or invalid.

If Kanoe lives in Honolulu, then she also lives on Oahu. So, if Kanoe does not live in Honolulu, then she also does not live on Oahu.
You should see that this argument is obviously invalid. You could arrive at this answer in two ways. One, the hard way -- just see that it is invalid the way we did Exercise III in Chapter 1. Even if the premise is true, the conclusion could be false. Two, the easy way -- the way logicians assess arguments by seeing patterns. For this method, you could do a quick translation:

\[ H \rightarrow O \quad \therefore \quad \sim H \rightarrow \sim O \]

And then easily see that this argument does not apply the rule of transposition correctly. If the conclusion were \( \sim O \rightarrow \sim H \), then the argument would be valid. You will have five short examples such as this one to do, each worth 4 pts. (20 pts. total).

Some final thoughts. Exam management is a large part of taking any exam. Three hours is a long time, but the two formal proofs could take a long time for some students to solve, even if they know the rules well. Be sure to work on ALL of the problems. Don’t leave any totally blank! Lots of points off. Also, you would not want to put in so much time on one problem leaving little time for the other one.

I will tell you the exact number of steps I think is the shortest to solve each proof. If you solve it in less steps, that would mean either that you are brilliant and found a more elegant proof than I did (this has happened, but it is very rare), OR (exclusive 'or' here) you have at least one X in your proof. If you don't solve the problem, keep going as long as you can deriving good steps. But make sure you spend time proofreading and making sure that every step you put down is correct. Many times students will get so engrossed in the challenge of solving the problem that they get careless in what they put down for justifications. In math, logic, and computer programming what you write down must be perfect. Computers don't understand, "Well you know what I meant."

For instance, what if a student did this in the middle of a proof?

10. \( \sim H \rightarrow \sim O \)
11. \( \sim H \rightarrow \sim \sim O \) (10)DN

I would have to mark step 11 with an X. Maybe the student meant to write down \( \sim H \rightarrow \sim \sim O \), which would be correct. Maybe I can tell because of the nature of the rest of his or her steps that he or she meant to write down \( \sim H \rightarrow \sim \sim O \). It does not matter. I have to mark it as an X.

What if you have done 20 or so quality steps on a proof and in proofreading you find a mistake right in the middle of your proof?! If you have time, you can restructure the entire proof eliminating the incorrect line. But usually you will not have time. So what do you do given that you have put down a lot of good steps but one is incorrect? My advice: just cross out the incorrect line, but leave everything else. The proof will be defective, but I will give you a lot of credit for proofreading
and finding a mistake, plus I will still give you credit for all the correct steps. For instance, suppose a student did these lines right in the middle of his or her proof.

10. \( \neg H \supset \neg O \)
11. \( \neg H \supset \neg \neg O \) (10)DN X
12. \( \neg O \supset H \) (11) Trans.

I would give the student credit for line 12 and any correct steps after this and also credit for crossing out line 11. Line 12 is correct based on 11 being a premise, even though line 11 is not correct.

Bottom line. Proof read, take your time, and check all your steps. You have 3 hours.

GOOD LUCK, AND THANKS FOR TAKING THE COURSE.