Assessment Date: Spring 2014

Faculty Name(s): David Topham

1. Course Name and Number:

   Discrete Mathematics for Computers  CS113

2. All Course SLOs from the Course Outline of Record:

   **Student Learning Outcomes**

   The student will:
   1. list, describe, and apply the mathematical tools used to examine the theoretical foundations of computer science.
   2. construct valid mathematical arguments using logical connectives and quantifiers and verify the correctness of a mathematical arguments using symbolic logic and truth tables.
   3. use discrete math and logic to specify computer applications and reason about programs in a systematic way.

3. Specific Course SLO(s) assessed as part of this project:

   2. construct valid mathematical arguments using logical connectives and quantifiers and verify the correctness of a mathematical arguments using symbolic logic and truth tables.

4. Assessment strategy or tool used in the assessment. (Describe below, and *if applicable* copy/paste any additional related documents at end of this form (i.e. Rubric, score sheet, test questions, essay assignment, etc.):

   The same question was put into the final exam as last year (Spring 2013) to assess the student's ability to construct and verify a valid mathematical argument using the logic techniques taught this semester. The same question was used since I wanted to see if adding additional practice problems of this type (in hw) made a difference in the success rate.
5. Specific aspects of the assessment tool which link up to specific Course SLOs being assessed (i.e. Which specific test questions measured which Course SLOs? Note: May describe with #4 above):

(The question # varied on each test since I used different versions to minimize copying)

Prove P or Q, P implies R, Q implies R models R using the deduction theorem, hypothetical syllogism, the law of cases, and the fact that P\lor Q \models (\neg P \Rightarrow Q).

Indicate which of these rules are being applied and to what lines.

1. P\lor Q | Premise
2. \neg P \Rightarrow Q
3. Q \Rightarrow R
4. \neg P \Rightarrow R
5. P \Rightarrow R
6. R

6. Results and analysis of the data. (Explain below and if applicable copy/paste any related documents, i.e. spreadsheets with data at the end of this document.):

I placed the responses into 3 categories: Perfect, Acceptable, and Not good. All the students made an attempt to answer the question, but unless they got it completely correct, I didn't consider it perfect. Acceptable indicates that they understood parts of the proof, but either had an incomplete answer or did not recognize the logical arguments being made.

This year results: Perfect (40%), Acceptable (46%), Not good (14%).
Last year results: Perfect (43%), Acceptable (31%), Not good (26%).

Interpreting this seems to indicate that the added emphasis on this type of problem in homework exercises brought more students from “Not good” to “Acceptable”, but did not increase any to the “Perfect” category.

7. Describe any faculty dialogue that occurred as part of the assessment process (i.e. Were results shared at a department meeting? Was there discussion about changing any SLOs? Etc.):

Other faculty members felt that this was a positive improvement since one of our goals is retention rate improvement (more than B to A improvement). I agree with idea but would still like to get improvement in the higher grades as well. I also noticed that the biggest problem with students that didn’t get perfect is that they failed to indicate the step numbers for the proof rules. It is possible this was an oversight, but just in case, I will emphasize that in hw too for next time.
8. **Next steps** (i.e. any planned revisions to curriculum or teaching strategies to promote student success, future assessment plans, etc.):

I plan to continue additional exercises to the homework problems to practice distinguishing between the various proof rules needed to understand this type of problem and to have the student develop more facility in recalling the characteristics of each one.

9. **Results of implemented changes, if available at this time:**

   It is clear that more practice on this type of proof was beneficial so I will incorporate that into the overall plan.