

Title: Computational Complexity

Version: 1



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Save Student Learning Outcome

**Outcome Category:**

- Communication Skills
- Critical Thinking Skills
- Content/Discipline Knowledge & Skills

**Define Student Learning Outcome:**

The student will be able to

choose one:

- | <u>ANALYSIS</u>                     | <u>APPLICATION</u>                | <u>COMPREHENSION</u>             | <u>EVALUATION</u>              | <u>KNOWLEDGE</u>                | <u>SYNTHESIS</u>                |
|-------------------------------------|-----------------------------------|----------------------------------|--------------------------------|---------------------------------|---------------------------------|
| <input type="radio"/> analyze       | <input type="radio"/> apply       | <input type="radio"/> classify   | <input type="radio"/> assess   | <input type="radio"/> cite      | <input type="radio"/> arrange   |
| <input type="radio"/> appraise      | <input type="radio"/> choreograph | <input type="radio"/> depict     | <input type="radio"/> choose   | <input type="radio"/> define    | <input type="radio"/> collect   |
| <input type="radio"/> calculate     | <input type="radio"/> compute     | <input type="radio"/> describe   | <input type="radio"/> decide   | <input type="radio"/> identify  | <input type="radio"/> combine   |
| <input type="radio"/> categorize    | <input type="radio"/> construct   | <input type="radio"/> discuss    | <input type="radio"/> defend   | <input type="radio"/> indicate  | <input type="radio"/> compose   |
| <input type="radio"/> compare       | <input type="radio"/> demonstrate | <input type="radio"/> explain    | <input type="radio"/> estimate | <input type="radio"/> label     | <input type="radio"/> create    |
| <input type="radio"/> contrast      | <input type="radio"/> dramatize   | <input type="radio"/> express    | <input type="radio"/> evaluate | <input type="radio"/> list      | <input type="radio"/> design    |
| <input type="radio"/> criticize     | <input type="radio"/> employ      | <input type="radio"/> locate     | <input type="radio"/> grade    | <input type="radio"/> match     | <input type="radio"/> formulate |
| <input type="radio"/> debate        | <input type="radio"/> generate    | <input type="radio"/> paraphrase | <input type="radio"/> judge    | <input type="radio"/> name      | <input type="radio"/> integrate |
| <input type="radio"/> determine     | <input type="radio"/> illustrate  | <input type="radio"/> recognize  | <input type="radio"/> justify  | <input type="radio"/> quote     | <input type="radio"/> manage    |
| <input type="radio"/> diagram       | <input type="radio"/> interpret   | <input type="radio"/> report     | <input type="radio"/> measure  | <input type="radio"/> recall    | <input type="radio"/> organize  |
| <input type="radio"/> differentiate | <input type="radio"/> operate     | <input type="radio"/> restate    | <input type="radio"/> rate     | <input type="radio"/> relate    | <input type="radio"/> perform   |
| <input type="radio"/> distinguish   | <input type="radio"/> practice    | <input type="radio"/> review     | <input type="radio"/> revise   | <input type="radio"/> repeat    | <input type="radio"/> prepare   |
| <input type="radio"/> experiment    | <input type="radio"/> schedule    | <input type="radio"/> summarize  | <input type="radio"/> score    | <input type="radio"/> reproduce | <input type="radio"/> produce   |
| <input type="radio"/> inspect       | <input type="radio"/> sketch      | <input type="radio"/> tell       | <input type="radio"/> value    | <input type="radio"/> select    | <input type="radio"/> propose   |
| <input type="radio"/> solve         | <input type="radio"/> use         |                                  |                                |                                 |                                 |

the computational complexity of algorithms used in the solution of a programming problem. This will be assessed upon completion of the 3-hour course COP 4531, Complexity and Analysis of Data Structures and Algorithms.

Preview

**Assessment and Evaluation Process:**

Be sure to include the standard(s) and measure(s).

This is an important skill for a computer scientist to have in order to be able to analyze and evaluate the most efficient approach to solving a problem. This skill will be evaluated by the faculty instructor in a course assignment. This will result in 80% of the students enrolled in COP 4531 during 2006-2007 scoring 70% or better as determined by a

**Method(s):**

choose  
one or  
more:

- behavioral observation
- capstone course evaluation
- class performance or presentation
- clinical evaluation
- course embedded assignment (often in tandem with exam question bank)
- course report
- department assessment
- departmental exam/comprehensive exam/preliminary exam
- faculty committee evaluation of dissertation, thesis or treatise
- faculty designed comprehensive or capstone examination and assignment
- instructor constructed exam
- internship evaluation of specific activity
- judged exhibition
- judged performance
- national or state standardized exam
- performance on licensing or other external examination
- portfolio of student work
- pre-test/post-test evaluation
- problem-solving exercise
- professional judged performance or demonstration of ability in context
- project evaluation
- public performance or presentation (juried)
- simulation
- videotaped or audio-taped performance
- written report or essay

Preview

**Results**

In Fall 2006, a programming assignment based on number theory and hashing was assigned (see web link below, problem #2). 56% of the students achieved a 70% or higher on this assignment. Several students, 28%, did not turn in an assignment.

In Spring 2007, the Assignment 1 was primarily on computational complexity, and it was chosen as the capstone assignment. 95% of the students achieved a 70% or higher on this assignment.

**Improvements Made or Action Plan Based on Analysis of Results**

The Fall 2006 assignment was based on material that was too difficult for many students. Thus, the suggestion is to provide more background material in class and in the assignment description to allow students more of a chance to succeed.

In Spring 2007 we easily met the objective of having 85% of the students obtain 70% or more. However, this statistic only gives an indication of the percentage of students who perform at an acceptable level. We should really try to increase the number of students who perform excellently. Less than 20% of the students obtained over 90% on this assignment. In contrast, most students obtained over 90% in the programming assignments.

Potential  
Budget  
Impact:

- Yes  
 No


All budgetary requests will be considered during the Institutional Effectiveness Plan Approval Process.


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**File Bank**

 All programming assignments for COP 4531 taught Fall 2006. Problem #2 is the capstone assignment.  
[http://www.cs.fsu.edu/~cop4531/programmi...]

 COP 4531 Assignment on Computational Complexity for Spring 2007.  
[http://www.cs.fsu.edu/~asriniva/courses/...]



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Body

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