Fall 2010   Summary of Direct Measure Assessment Data for the BS in Computer Science

In accordance with the SCIS Assessment Plan for the BS in Computer Science, direct measures of attainment of Student Outcomes were performed as follows:

1. Embedded Assessment of BS in CS Student Outcome (a) (Foundations area) in MAD 3512 Theory of Algorithms.
2. Embedded Assessment of BS in CS Student Outcome (b) (Computer Science core) in COP 4555 Principles of Programming Languages.
3. Assessment of BS in CS Student Outcome (e) (Social & Ethical concerns) in CGS 3092 Professional Ethics and Social Issues in Computing.
4. Assessment of all BS in CS Student Outcomes, (a) through (h), via observation of the 7 Senior Projects presented in Fall 2010.

The data referenced in this summary may be viewed at the assessment data page for Fall 2010:
http://users.cs.fiu.edu/~pestaina/cis4911.html#fall2010

BS in CS Student Outcomes (Revised Fall 2010)

To complete the program of study for the BS in Computer Science, every student will

a) Demonstrate proficiency in the foundation areas of Computer Science including mathematics, discrete structures, logic and the theory of algorithms.
b) Demonstrate proficiency in various areas of Computer Science including data structures and algorithms, concepts of programming languages and computer systems.
c) Demonstrate proficiency in problem solving and application of software engineering techniques.
d) Demonstrate mastery of at least one modern programming language and proficiency in at least one other.
e) Demonstrate understanding of the social and ethical concerns of the practicing computer scientist.
f) Demonstrate the ability to work cooperatively in teams.
g) Demonstrate effective communication skills.
h) Have experience with contemporary environments and tools necessary for the practice of computing.

Embedded Assessment of Outcome (a) in MAD 3512 Theory of Algorithms

4 students enrolled in MAD3512 completed a 5-question multiple choice assessment quiz. The quiz and results are attached. Due to scheduling anomalies, only 4 students completed MAD 3512 in Fall 2010.

Expectation: 75% of students completing the assessment quiz should score 3.5/5 or higher.

Observation: 1 student scored 3/5, 2 students scored 2/5, 1 student scored 0/5.

Conclusion: The available data are insufficient. This assessment will be repeated in Spring 2011.

Embedded Assessment of Outcome (b) in COP4555 Principles of Programming Languages

19 students enrolled in COP 4555 completed a 10-question multiple choice assessment quiz. The quiz and results are attached.

Expectation: 75% of students completing the assessment quiz should score 7/10 or higher.

Observation: The average score was 6.84 out of 10, and the median score was 7 out of 10. 63% of the students answered at least 7 out of 10 questions correctly.

Embedded Assessment of Outcome (e) in CGS 3092 Professional Ethics and Social issues

From each of 10 assigned topics, one oral (PowerPoint) student presentation and one written (paper) student presentation were analyzed to determine whether the presentation addressed issues of Social Concern and/or issues of Ethical Concern. For each facet (Social, Ethical), the analysis identified whether an assertion under that facet (Social, Ethical) was supported by evidence, and whether counter arguments on that assertion were provided. For each topic, this analysis yielded 8 binary (0/1) scores for an overall rating in the range 0 .. 8.

Expectation: Each topic should receive a minimum rating of 75% or a score of 6 from 8.

Observation: 8 topics were rated at 100% (8/8), 2 topics were rated at 50% (4/4).

Assessment via Senior Project
7 projects were observed for the purpose of obtaining ratings of attainment of BS-CS outcomes by at least 2 faculty members. The ratings are on a scale of 1..5, or 0 if the project provided insufficient evidence about a particular outcome. A mediation rating was obtained when the initial ratings differed by more than 1 point, or when a rater did not respond prior to preparation of this summary. The scoring rubric followed by the raters is attached. The project ratings are summarized in the following table. The mediation ratings (if any) are in **bold**.

	Outcome (a)	Outcome (b)	Outcome (c)	Outcome (d)	Outcome (e)	Outcome (f)	Outcome (g)	Outcome (h)
Project 1	3	2	5	5	4	5	5	5
	5	5	5	5	5	5	5	5
(M)	**3**	**3**	**5**	**5**	**4**	**5**	**5**	**5**
Project 2	1	0	5	5	4	5	5	5
	2	4	5	5	3	5	5	4
(M)	**1**	**2**	**5**	**5**	**5**	**5**	**5**	**4**
Project 3	5	5	5	5	5	5	5	5
	4	4	4	4	4	5	4	4
Project 4	2	2	4	3	2	3	3	4
	2	4	5	5	1	5	5	4
(M)	**3**	**2**	**5**	**5**	**1**	**5**	**5**	**4**
Project 5	4	5	5	5	5	5	5	5
	3	4	5	5	5	5	5	5
Project 6	3	5	5	5	5	5	5	5
(M)	**3**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Project 7	4	5	5	5	4	5	5	5
(M)	**3**	**5**	**5**	**5**	**3**	**5**	**5**	**5**
	Outcome (a)	Outcome (b)	Outcome (c)	Outcome (d)	Outcome (e)	Outcome (f)	Outcome (g)	Outcome (h)
Mean	*3.00*	*3.71*	*4.93*	*4.93*	*3.93*	*5.00*	*4.93*	*4.64*

The means expressed in the final row of the table are averaged over the seven project outcome ratings, using either the mediated rating or the average of the 2 un-mediated ratings.

Reliability: Prior to mediation, 5 of the 7 projects were each rated across all 8 student outcomes by 2 raters. The consistency of the outcome attainment ratings is summarized in the following table.

Identical Ratings	Ratings differing by 1	Ratings differing by 2+
18/40	15/40	7/40
45%	40%	17.5%

In some cases, there is discrepancy between a raters rubric score and the score recorded on the rating sheet. Only 45% of the paired ratings are identical, and 82.5% of the ratings are either identical or differ by 1. The greatest disparity occurs in the ratings of outcomes (a) and (b) where 4 ratings differ by more than 1, and 5 differ by exactly 1, indicating that the rubric, in general, and for outcomes (a) and (b) in particular, must be refined to decrease rater subjectivity and/or error.

Expectation: Attainment of all outcomes should be 75% or 3.75 on a 1—5 scale, or better.

➤ Outcome (a): *Demonstrate proficiency in the foundation areas of Computer Science…***3.00**

Observation: 2 of 16 raters scored attainment of outcome (a) as *excellent (5)*, and 3 scored it as *very good (4)*; 7 raters scored it as *good (3)*; 5 raters scored attainment as *either fair (2)* or *poor (1)*.

➤ Outcome (b): *Demonstrate proficiency in various areas of Computer Science…***3.71**

Observation: 7 of 16 raters scored attainment of outcome (b) as *excellent (5)* and 4 scored it as *very good (4)*; 1 rater scored it as *good (3)*; 4 raters scored it as *fair (2)*; 1 rater of project 2 thought that attainment of outcome (b) was not demonstrated.

➤ Outcome (e): *Demonstrate understanding of the social and ethical concerns …***3.93**

Observation: Only project 4 received ratings of *fair (2)* or *poor (1)* for attainment of outcome (e). 1 project 2 rater assigned a rating of *good (3)*; 5 raters scored it as *very good (4)*; 8 raters scored it as *excellent (5)*.

➤ Outcome (c): *Demonstrate proficiency in problem solving and application of software engineering…***4.93**
➤ Outcome (d): *Demonstrate mastery of at least one modern programming language…***4.93**
➤ Outcome (f): *Demonstrate the ability to work cooperatively in teams…***5.00**
➤ Outcome (g): *Demonstrate effective communication skills…***4.93**
➤ Outcome (h): *Have experience with contemporary environments and tools…***4.64**

Observation: Attainment of outcomes (c), (d), (f), (g) and (h) as demonstrated in the Senior Projects is almost uniformly rated as *very good (4)* or *excellent (5)* across all seven projects.