Addenda AY2010-11   Summary of Direct Measure Assessment Data for the BS in Computer Science

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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 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.

The following assessment events were concluded following preparation of the Direct Measure Assessment summaries for the Spring 2011 semester (AY 2010-11):
1. Course-embedded Assessment of BS in CS Student Outcome (b) (Computer Science core) in COP 4338 Computer Programming III and COP 4610 Operating Systems (Spring and Summer 2011).
2. Course-embedded Assessment of BS in CS Student Outcome (d) (Computer Programming) in COP 3337 Programming II (Spring 2011), COP 3530 Data Structures (Spring 2011), and COP 4338 Computer Programming III (Summer 2011).
3. Additional analysis of CGS 3092 raw data from Fall 2010.

The data yielded by these events are referenced in this summary and may be viewed as follows:
1. Results of application of Computer Systems rubrics in COP 4610 by Dr. Raju Rangaswami.
    http://users.cs.fiu.edu/~pestaina/cis4911.html#spring2011
2. Results of application of the C-Language Programming rubric, and the Computer Systems Multithreading rubric in COP 4338 by Dr. Mark Weiss.
    http://users.cs.fiu.edu/~pestaina/cis4911.html#summer2011
3. Results of application of the various Programming Assessment Rubrics to completed projects in COP 3530 applied by Prof. Melita Jaric, and in COP 3337 by Prof. Norman Pestaina.
    http://users.cs.fiu.edu/~pestaina/cis4911.html#spring2011
4. Results of application of the Ethics and Social Issues rubric to projects in CGS 3092.
    http://users.cs.fiu.edu/~pestaina/cis4911.html#fall2010

Scheduling Note:
This assessment period ended with Spring 2011. Data from Summer 2011 assessments will be included into the next assessment cycle. An exception was made for the COP 4338 data from Summer 2011 in order to obtain a more complete assessment data for Outcome d) Programming, and for Outcome b) Computer Systems. The Programming and Computer Systems rubric applications were being done retroactively, and some of the relevant project and/or assignment artifacts from Fall 2010 and Spring 2011 had not been archived. This circumstance also accounts for the absence of data for the Abstraction and Exceptions components of the Programming outcome assessment.

Embedded Assessment of BS in CS Student Outcome (b) (Computer Science core) in COP 4338 Computer Programming III, and COP 4610 Operating Systems.

Completed projects in COP 4338 and COP 4610 were evaluated by application of the Computer Systems Multithreading rubric (COP 4338, Summer 2011), and the Computer Systems Memory Management and Storage Management rubrics (COP 4610, spring 2011). On each rubric, the projects are scored against several rubric-points to obtain a rating expressed as a % of the maximum possible rating. These data are summarized in the following table. The COP 4338 projects are individual assignments while the COP 4610 projects are team projects.

Computer Systems	Multithreading (COP 4338)	Memory Management (COP 4610)	Storage Management (COP 4610)
Sample Size	21	14	14
N >= 75%	18	14	13
% >= 75%	86%	100%	93%

Table 1: **Results of application of the =Computer Systems rubrics**

Expectation:
For each Computer Systems rubric, 75% of projects should be rated at 75% or better.

Observation:
The metrics yielded by application of all three Computer Systems rubrics are well in excess of the minimum acceptability threshold.

Embedded Assessment of BS-CS Student Outcome (d) in COP 3337 Computer Programming II, COP 3530 Data Structures, and COP 4338 Computer Programming III

This Student Outcome d) describes mastery of one programming language, Java, and proficiency in another, C.

Students' mastery of each of 6 facets of Java programming is evaluated by application of facet-focused rubrics to completed programming projects in COP 3337 and COP 3530. On application of a rubric, all projects are scored against several rubric points resulting in a rating expressed as a % of the maximum. The acceptable rating is set at 75%. These assessments were conducted retroactively, and did not include application of the Abstraction or Exceptions rubrics.The rating data are summarized in the following table:

Computer Programming	API Usage (COP 3530)	Recursion (COP 3530)	Linked Structures (COP 3530)	Abstraction	Inheritance (COP 3337)	Exceptions
Sample Size	9	12	12	n/a	19	n/a
N >= 75%	5	11	6		14	
% >= 75%	56%	92%	50%		74%	

Table 2-1: Results of application of the Java Programming rubrics

Students' facility in a second language is evaluated by application of the C-Language Programming rubric to completed early programming project(s) in COP 4338. The projects are scored against several rubric points to obtain a rating expressed as a % of the maximum. Later projects are also evaluated against the Computer Systems Multithreading rubric in similar fashion. In either case, the acceptable rating is set at 75%. These data are summarized in the following table:

	C-Language	Multithreading
Sample Size	25	21
N >= 75%	20	18
% >= 75%	80%	86%

Table 2-2: Results of application of the C-Language and Multithreading rubrics

Expectation:
a. For each Java-based Programming rubric, 75% of projects should be rated at 75% or better.
b. For each of the C-Language Programming and Computer Systems rubrics, 75% of projects should be rated at 75% or better.

Observation:
a. The rating yielded by the Recursion rubric is very high, the rating from the Inheritance rubric is acceptable, but the ratings on the API Usage and Linked structures rubrics are at unacceptable levels. Of the 6 failing Linked Structures samples, 4 are a single rubric point below the minimum for an acceptable 75% rating.
b. On the C-Language Programming rubric, all projects are rated well above the 75% threshold.

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

The data analyzed here were presented in the Fall 2010 summary. A finer resolution of the separate Ethics and Social Issues facets of this outcome is merited, and is presented following.

SAMPLE Fall 2010 CGS 3092	Social Concerns in Computing			Ethical Concerns in Computing		
		<-- 4 Max			<-- 4 Max	
	N	%	>=75	N	%	>=75
Privacy in the Workplace	4	100%	1	4	100%	1
4th Amendment vs Net	4	100%	1	4	100%	1
Ownership in Virtual Worlds	4	100%	1	4	100%	1
Ethics of Reverse Engineering	0	0%	0	4	100%	1
Privacy and GPS	4	100%	1	4	100%	1
Military Use of bioengineered…	4	100%	1	4	100%	1
Cloud Computing & Privacy	4	100%	1	4	100%	1
Human Enhancement	4	100%	1	4	100%	1
Reverse Engineering	4	100%	1	4	100%	1
Emergence of Patents	0	0%	0	4	100%	1
Sample Size			10			10
# Samples >= 75%			8			10
% Samples >= 75%			80%			100%

Table 4: Summary of Social and Ethics assessment data from CGS 3092

Expectation:
a) For the *Social Concerns* facet of this outcome, 75% of the projects should be rated at 75% (3 of 4) or higher.
b) For the *Ethical Concerns* facet of this outcome, 75% of the projects should be rated at 75% (3 of 4) or higher.

Observation:
a) 80% of projects are rated at 100% (4 of 4) on the *Social Concerns* facet of this outcome.
b) 100% of projects are rated at 75% (3 of 4) or higher on the *Ethical Concerns* facet of this outcome.