

From: Department of Computer Science
To: Committee on Assessment
Date: May 4, 2004
Subject: Department of Computer Science Assessment Plan

The Department of Computer Science would like to modify its assessment plan to achieve the following goals:

- To allow us to assess *all of our major programs* in CS, Digital Communications, and Information Systems – The current plan only addresses the BCS program.
- To replace our existing on-line assessment instrument that we have been using with a *modified version of the campus-wide assessment instrument* – The on-line system has been difficult to maintain and should be replaced with a more flexible, campus-wide system.
- To include a periodic assessment by an *external advisory board* – We believe that such a board would strengthen our program, and our recent ABET visitation team suggested one as well.

These changes are now reflected in the attached, updated version of our assessment plan.

Assessment Plan
Department of Computer Science
March 16, 2004

Program Objectives: Within the general framework of a liberal arts education, as described in **An Engagement with God's World: the Core Curriculum of Calvin College**, the general objectives for the Calvin College Computer Science program are to:

- a. (*Department Vision Statement*) Advance the kingdom of Jesus Christ with respect to computing, by equipping young men and women with the knowledge, skills, and values to solve computing-related problems in a socially and ethically responsible way, as informed by a Reformed Christian world-view.
- b. Provide a departmental environment that facilitates goal a, including adequate faculty, laboratory, curricular, and library resources.

Program Outcomes: We will demonstrate that graduates of the Calvin College Department of Computer Science have

1. *Knowledge.*
 - a. A broad theoretical framework in which to understand the technologies of today and tomorrow.
 - b. A deep understanding of specific current technologies chosen for their educational value.
 - c. A broad training in the liberal arts such as makes for a well-rounded individual.
2. *Values.*
 - a. A sensitivity to social and ethical issues surrounding technology.
 - b. An understanding of how to use technology related abilities to serve others.
 - c. An understanding of how Reformed Christianity affects all of a person's life, including vocation.
3. *Skills.*
 - a. The ability to use up-to-date hardware and software platforms and tools.
 - b. The ability to apply technological skills in an employment setting, or conduct a research project.
 - c. The ability to communicate effectively through speaking, writing, and other media.
 - d. The ability to teach oneself, so as to support and encourage life-long learning.
 - e. The ability to think carefully about responsible decision-making with respect to technology and to articulate those thoughts, as informed by a Reformed Christian world-view.

Plan of Action:

Computer Science is a dynamic, rapidly changing discipline. As a result, the Department of Computer Science will

1. Conduct the annual assessment activities described below;
2. Conduct a summary internal assessment every three years as described below; and
3. Submit to a formal external assessment every six years as described below.

1. Annual Assessment Activities:

- a. The Educational Testing Services Computer Science Major Field Assessment Test (CS-MFAT). Graduating seniors will be required to take the CS-MFAT near the end of CPSC 392 (but their performance will not affect their grade in 392). This will provide data for comparing our program against other Computer Science programs across the nation.
- b. Three annual surveys, each administered in the Spring semester of each year to students and graduates of all our departmental programs:
 - 1) A senior assessment survey, which will ask graduating seniors to assess the program. (See Appendix C.)
 - 2) A one-year alumni assessment survey, which will ask alumni to assess the program one year after graduation. (See Appendix D.)
 - 3) A five-year alumni assessment survey, which will ask alumni to assess the program five years after graduation. (See Appendix E.)
- c. Student and faculty annual reports. Each faculty member and student organization affiliated with the department will file an annual activity report for the previous year. (For faculty members, this will be a copy of the report they file with the Provost's office.)

2. Internal Assessment Activities:

For each internal assessment, the department will appoint a Computer Science faculty member to serve as the *Assessment Coordinator*. This person will be responsible for conducting the annual assessment-related activities, including all collection, assimilation, and analysis of assessment-related data, over a three-year term. At the conclusion of their term, the Assessment Coordinator will prepare and distribute an assessment report that summarizes the data and makes specific recommendations regarding program improvements. The Assessment Coordinator will also be encouraged to evaluate the assessment procedure, and propose changes as necessary.

The internal assessment activities will be:

- a. Student course evaluations. At least every 3 years, students will be asked to review the course objectives and assess the extent to which the course meets those objectives. (See Appendix A.)
- b. Faculty course evaluations. At least every 3 years, the faculty member teaching that course will be asked to review the course objectives and assess the extent to which the course meets those objectives. (See Appendix B.)
- c. Every three years, the department's Curriculum, Library, and Facilities Committees will review and submit reports on the states of the department's curriculum, library holdings, and laboratory and classroom facilities, respectively.
- d. External review board. The department will assemble an external review board consisting of from 5 to 6 representatives from academia and industry. This board will be invited to campus to review the current program and the assessment report.

A three semester-hour course reduction for these activities will be requested from the administration during each year of the appointment. This will be compensation for time spent in developing and maintaining WWW survey forms and scripts, mailing and tabulating the data from alumni survey forms, tabulating the data from student and faculty course evaluations, preparing and maintaining spreadsheets for analysis of the collected data, administering the MFAT to graduating seniors, writing the internal assessment report, and coordinating the CAC/ABET external assessment.

3. *External Assessment Activities*: Every six years, the department will undergo an external review by an evaluation team from CAC/ABET as part of its accreditation process. The Assessment Coordinator during a six-year external CAC/ABET review will be responsible for coordinating that review.

The data resulting from these activities will be used to review and make improvements on the Computer Science program at Calvin College.

Resource Allocation Implications.

The Assessment Plan described above provides the departmental Assessment Coordinator with a three semester-hour course-load reduction each year of their appointment. This is consistent with that being requested by the Department of Engineering.

The CS-MFAT costs roughly \$25 per test. We currently have 28 graduating seniors, for a total cost of about \$700.

The CAC/ABET external (six-year) review currently carries a fee of \$6,100, plus an annual accreditation maintenance fee of \$675. These costs were approved by the administration during the Spring semester of 1998.

Collecting and supporting the external review board will incur expenses every three years of approximately \$5000 for travel, lodging and other expenses.

Appendix A: Student Course Evaluation Form

(These questions will be added to the form that students complete as part of the campus-wide evaluation process. The results will be compiled in the standard manner..)

Student Course Evaluation Form

The *catalog description* for the course will be displayed during the evaluation period.

1) On a scale of 0 to 4, please rate how well this course matches its catalog description:

- 0 == not at all
- 1 == somewhat
- 2 == reasonably well
- 3 == closely
- 4 == very closely

2) If you can identify any aspects of the course that were particularly helpful to you to master the course material, please note them in the space below.

3) If you can identify changes to the course that would help you to better master the course material, please note them in the space below.

Appendix B: Faculty Course Evaluation Form

(Answers to these questions will be provided for each course by the relevant faculty member.)

Faculty Course Evaluation Form

- 1) On a scale of 0 to 4, please rate how well this course matches its catalog description (0 == not at all; 1 == somewhat; 2 == reasonably well; 3 == closely; 4 == very closely):

- 2) From your perspective, what aspects of the course worked well towards achieving specific course objectives?

- 3) Please comment on any aspects of the course that did not work well towards achieving specific objectives. If possible, please suggestion alternative approaches that would do a better job of achieving course objectives.

Appendix D: First-Year Alumni Survey Form

(This questionnaire is similar to the one you completed as a senior. We are interested to see if your perceptions about the program have changed in the year since you graduated.)

0. What degree did you receive?
- B.A. or B.S. (circle one) in Computer Science, Information Systems, or Digital Communication (circle one)
 - B.C.S.

1. Which best describes your current status? Industry professional _____
 Graduate student _____
 Other _____

2. The table below lists the outcomes the department hopes its programs will achieve for its graduates. In the left-most column, please rate each outcome on a scale of 0 – 4: (0 == not at all; 1 == somewhat; 2 == reasonably well; 3 == closely; 4 == very closely) to indicate how well you think the program has achieved that outcome for you:

Rating	Outcome: Graduates will have...
	A broad theoretical framework in which to understand the technologies of today and tomorrow.
	A deep understanding of specific current technologies chosen for their educational value.
	A broad training in the liberal arts such as makes for a well-rounded individual.
	A sensitivity to social and ethical issues surrounding technology.
	An understanding of how to use technology related abilities to serve others.
	An understanding of how Reformed Christianity affects all of a person’s life, including vocation.
	The ability to use up-to-date hardware and software platforms and tools.
	The ability to apply technological skills in an employment setting, or conduct a research project.
	The ability to teach oneself, so as to support and encourage life-long learning.
	The ability to think carefully about responsible decision-making with respect to technology and to articulate those thoughts, as informed by a Reformed Christian world-view.

3. What aspects of your experience in the Calvin computing program do you think contributed the most to the achievement of these outcomes?

4. What aspects of your experience in the Calvin computing program do you think should be changed so as to improve the achievement of these outcomes?

5. We welcome any other comments concerning Calvin's computing program:

Appendix E: Five-Year Alumni Assessment Form

(This questionnaire is similar to the one you completed as a senior. We are interested to see if your perceptions about the program have changed in the five years since you graduated.)

1. What degree did you receive from Calvin?
 - B.A.
 - in Computer Science
 - in Information Systems
 - in Digital Communication
 - B.S.
 - B.C.S.

2. Have you earned any advanced degrees? M.S. Ph.D. Other_____

3. Which best describes where you work? Academia Industry Other_____

4. The table below lists the outcomes the department hopes its programs will achieve for its graduates. In the left-most column, please rate each outcome on a scale of 0 – 4: (0 == not at all; 1 == somewhat; 2 == reasonably well; 3 == closely; 4 == very closely) to indicate how well you think the program has achieved that outcome for you:

Rating	Outcome: Graduates will have...
	A broad theoretical framework in which to understand the technologies of today and tomorrow.
	A deep understanding of specific current technologies chosen for their educational value.
	A broad training in the liberal arts such as makes for a well-rounded individual.
	A sensitivity to social and ethical issues surrounding technology.
	An understanding of how to use technology related abilities to serve others.
	An understanding of how Reformed Christianity affects all of a person's life, including vocation.
	The ability to use up-to-date hardware and software platforms and tools.
	The ability to apply technological skills in an employment setting, or conduct a research project.
	The ability to teach oneself, so as to support and encourage life-long learning.
	The ability to think carefully about responsible decision-making with respect to technology and to articulate those thoughts, as informed by a Reformed Christian world-view.

5. What aspects of your experience in the Calvin computing program do you think contributed the most to the achievement of these outcomes?

6. What aspects of your experience in the Calvin computing program do you think should be changed so as to improve the achievement of these outcomes?

7. We welcome any other comments concerning Calvin's computing program: