

# Academic Program Assessment Plan

## Undergraduate Programs

### CIS Program - Hasan School of Business

#### CSU-Pueblo

#### Identification

This is the assessment plan for the CIS undergraduate program at the Hasan School of Business (HSB) at Colorado State University – Pueblo (CSU-Pueblo). The plan was developed by the CIS faculty during 2011. The contact entity for this plan is the CIS Program Coordinator and the HSB Dean.

#### Mission, Goals and Student Learning Outcomes

*What is the mission of the department and how does it relate to the school's mission?*

The mission of the Computer Information Systems (CIS) program is to prepare graduates for successful careers in the computer information systems and information technology (IT) fields. Students complete a comprehensive, relevant, computer information systems curriculum that delivers high-demand knowledge, skills, and abilities in: software and web application development, system analysis and design, network design and administration, database design and development, operating systems, and IT security.

The CIS program prepares students to assume team member and leadership roles in the IT field by developing their skills in technology, communication and critical thinking, and instilling in them awareness of the global economy and ethical behavior.

The intellectual pursuits of our faculty focus primarily on applied scholarship and instructional development. Our outreach activities—developed in partnership with the community—serve to enhance the quality of life and economic well-being in southeastern Colorado.

The CIS mission reflects not only the role of the CIS program within the University community, but also the expectations for the CIS program as a provider of quality IT education for our region. The CIS program is committed to the pursuit of continuous improvement.

The current version of the CIS Mission, in conjunction with the HSB and CSU-Pueblo Mission, illustrates how the institution has evolved to provide degree programs that serve the region. The CIS Mission emphasizes teaching and developing CIS students, conducting research appropriate for our institution type, and serving the community in ways that will enhance the economic well-being of citizens of southeastern Colorado.

*What are the student learning outcomes and how do they relate to the program's mission?*

For undergraduate students, the CIS program's five learning outcomes are that students will be able to

- communicate effectively;
- analyze problems and develop solutions;
- recommend ethical alternatives and appropriate actions;
- apply global business concepts; and
- utilize technology in a business information systems environment.

We plan to monitor whether our learning outcomes are what is needed to achieve our mission. Our current thinking is that the goals support what we are trying to achieve in terms of developing students' skills in technology, team development, communication and critical thinking and instilling in them awareness of the global economy and ethical behavior.

*Are learning outcomes written as observable skills and abilities?*

All of the CIS program's learning outcomes are observable.

*Are the outcomes discrete (i.e., non-overlapping)?*

The five undergraduate learning outcomes are discrete and orthogonal.

*Are the outcomes limited in number to five or six but not more than eight?*

The CIS program has five undergraduate learning outcomes. We believe these are currently sufficient. As we determine how to achieve student mastery on all the outcomes, we may consider adding more outcomes to address important goals we have for our graduates.

*What are the performance criteria?*

When assessing student performance on a particular learning outcome, we will rate whether the student—on the artifact we are evaluating—exceeded, met, or did not meet the learning sub-goals being assessed with that artifact. The actual criteria for evaluating the level of performance (e.g., exceeds, meets, does not meet expectations) will be specified in a rubric. For example, for the undergraduate learning outcome *our students will be able to analyze problems and develop solutions*, one of the measurable objectives (or sub-skills) is *development of recommendations*. The rubric entry for *exceeds expectations* for this sub-skill is "makes viable recommendations supported by appropriate analyses."

*What level of performance is expected of students for each criterion?*

For each criterion, we expect that at least 70 percent of our undergraduate students will meet or exceed the learning objective.

*How are the learning outcomes communicated to department faculty and students, and to the community?*

A primary way of communicating our learning outcomes is on the CIS program Web site. The CIS learning outcomes are described in the CSU-Pueblo Catalog and on the CSU-Pueblo Web site. In addition, our learning outcomes are discussed with and approved by the CIS program's Industrial Advisory Board. CIS faculty have discussed the possibility of listing on the syllabus and discussing

with students the learning outcomes addressed in each course. We also plan to introduce students to the CIS learning outcomes in CIS 150, *Introduction to Computer Information Systems*.

## **Curriculum**

*Do the courses and their objectives, in aggregate, meet the outcomes for the program?*

We plan to answer this question by reviewing our curriculum map using a two-step process. First, we will look for gaps in the map (i.e., goals that are not addressed in at least one course). Second, we will examine the levels at which each goal is addressed. It must be determined if there are sufficient opportunities through which students can build related skills. For example, is the goal "introduced" in student assignments in 200-level courses, "developed" in 300-level courses, and "mastered" at the 400 level? For more difficult-to-acquire skills, are there several courses that address the goal at the "developing" level?

During 2011 the CIS program conducted a curriculum-mapping process. We are in the process of reviewing the resulting map to determine how effectively we are meeting the five learning outcomes in our overall curriculum.

*Does the curriculum provide opportunities for students to demonstrate they have learned the program outcomes?*

The CIS program undergraduate curriculum maps indicate that faculty require students to demonstrate each of the learning goals and sub-goals in our core courses required of every CIS major. Artifacts of student learning include exams, papers, presentations, case studies and a required senior capstone project. These artifacts give students opportunities to build and demonstrate skills throughout the curriculum.

## **Assessment Methods**

*What assessment methods will be used to measure each of the learning outcomes?*

The CIS program plans to primarily use a direct-assessment approach. Artifacts of student work pertinent to a particular learning outcome will be collected, and these artifacts evaluated by faculty external to the course in which the artifact was collected to determine students' level of mastery. With the exception of the senior capstone project, only individual student's work will be assessed (i.e., not group projects). Each learning outcome has been broken down into sub-skills, or "measurable objectives," that are components of the overall learning objective. Students' level of mastery will be assessed using rubrics which have been developed for this purpose. To ensure inter-rater reliability, we will be implementing processes whereby raters meet before and after artifacts are assessed. In addition, for follow-up (loop-closing) activities on subsequent artifact evaluation, the same raters will be utilized, when possible, for consistency and reliability.

The CIS program includes a senior capstone project course required of all majors. This course requires students to apply the communication, problem solving, and technical skills they have learned during the completion of the CIS program. Each team of students is assigned a live project in the Pueblo (or sometimes surrounding areas) community. The team is evaluated on not only the final IT product they develop, but the process they follow in completing the project.

Finally, the CIS program meets annually with the CIS Industrial Advisory Committee to get feedback on the effectiveness of the CIS curriculum in meeting the needs of the IT industry along the Colorado Front Range.

Our previous assessment plan included the completion of a survey by CIS graduates to determine the effectiveness of the program and curriculum in preparing them for jobs in IT. This survey was never completed, but we would still like to make it happen at some future date.

*Are descriptions of the assessment processes clear and detailed?*

Creating clarity for the overall assessment process and where the CIS program stands on each learning outcome will be a challenge. Faculty must develop a variety of documents that make the process much clearer. For example, for each learning outcome, we will develop a summary document (i.e., dashboard) encapsulating what we have learned about student performance, actions taken to address shortcomings, and results of those interventions

*Are the assessment processes explicitly linked to the student learning outcomes?*

All of the CIS program assessment processes will be explicitly linked to the student learning outcomes.

*Are the means of assessment commensurate with the available resources?*

Keeping assessment to a maintainable level of effort while achieving clear insight into what our students are learning (and not learning) is our goal. Assessment work does, at times, contribute to role conflict and role overload for faculty members because time spent on assessment detracts from that available for other important demands (e.g., research). We plan to develop ways to streamline our assessment processes, making them more efficient, and also to spread assessment work more evenly rather than engaging in spurts of prior to assessment report completion dates.

*What timetable will be implemented for each method, who is involved, and who is responsible for them?*

We plan to develop a timetable to assess each of our learning objectives every three years. All faculty members will be involved in assessing student performance, drafting action plans and implementing the action plans. The assessment process will be coordinated by the CIS faculty. Overall responsibility for assessment rests with the Dean.

The current thought on a suggested time table for evaluating SLOs is as follows:

- 2011-12: Technology, Problem Solving
- 2012-13: Communication, Ethical Awareness
- 2013-14: Global Awareness

*Are multiple methods employed?*

The CIS program uses multiple methods to assess student learning. First and foremost, direct measurement will be utilized where individual artifacts are gathered in courses and then evaluated

by faculty members who do not teach the courses. Actions will then be designed in response to results and patterns. In terms of indirect assessment, we seek input from students in the CIS *Senior Seminar* class about the degree to which our courses, facilities, and teaching methods are promoting their learning. And finally, input from the CIS Industrial Advisory Board is utilized to insure the currency and relevance of the CIS curriculum.

*Are sufficient direct measures of student learning utilized?*

The CIS program utilizes direct-assessment methods as a primary source of evaluation. Our judgments about whether students are meeting our learning objectives will be based exclusively on faculty evaluations of artifacts of student work from our courses.

*Can these methods also be used for accreditation purposes?*

The CIS program plans to begin preparing to meet the accreditation standards of The Association to Advance Collegiate Schools of Business (AACSB). The AACSB requires rigorous assessment of student learning, the processes described in this Assessment Plan will be helpful in obtaining the CIS program's accreditation with the AACSB.

*How are students involved in the assessment process?*

Currently, student involvement in assessment processes is minimal. However, we plan to begin implementing activities aimed at increasing student awareness. Eventually, we plan to have the CIS program learning objectives approved by the HSB Dean's Advisory Council (a group of HSB and CIS students). Another method for involving students we will be gathering feedback from students in each course or major about how well they perceive that student learning outcomes were addressed. The SALG (student assessment of their learning gains) may prove useful for this. The SALG Web site is a course-evaluation tool that allows instructors to gather learning-focused feedback from students.

## **Assessment Results**

*How are assessment results evaluated?*

Our plan is that after assessing artifacts of student work using rubrics of the learning outcomes, the percentages of students exceeding, meeting, and not meeting each sub-goal of each learning objective will be calculated. These results will then be shared with faculty in meetings to discuss the results. Action plans to address any deficiencies will then be discussed and, if appropriate, implemented.

*How are faculty and students involved in interpreting and evaluating results, and developing strategies to improve the curriculum?*

Our plan is that once faculty have seen the overall results of the assessment process and the percentage of students meeting each sub-goal, a "sensemaking" process begins. Faculty members will discuss the results and provide examples that relate to what the overall numbers indicate. Once faculty have considered and discussed the assessment results, meetings will be held to talk about root causes of sub-par performance on any outcomes and possible actions to address the

shortcomings. We may be able to gain additional insights to causes of sub-par performance by involving students in interpreting results.

*Are the results used to help the department achieve its program outcomes?*

Prior to moving to HSB in 2005, the CIS program regularly completed a program assessment and used the information to assist in achieving the program outcomes. After moving to HSB, our intention was to become fully integrated into the HSB assessment process and the AACSB accreditation. Due to numerous changes in the CIS program chair and program coordinator positions, the HSB Dean position and a large number of CIS faculty changes, these changes were never fully integrated. As of February 2011, the HSB AOL committee and CIS faculty agreed to wait until the next AACSB accreditation cycle to incorporate the CIS program into the accreditation process. In the meantime, the CIS program is currently redesigning the CIS program assessment process to seamlessly move into the process currently used by HSB.

*How are assessment results used to improve the curriculum and program?*

We plan for assessment to become a key activity in the CIS program. The results of our assessment activities will be discussed and used to guide our efforts to improve our admissions processes, our teaching, and our curriculum. Prior to 2005, the assessment results were used to update individual courses as well as to periodically make major changes in the curriculum. CIS has been a rapidly changing field over the past 30 years. The CIS Industrial Advisory Board has been used as a major sounding board to determine the currency and relevance of the CIS curriculum in meeting the needs of the Colorado Front Range IT industry. As a result of our assessment and resulting curricular changes, CIS graduates are well known among front-range employers for not only having the right skills, but knowing how to use them without additional training.

We had also completed an annual survey of CIS seniors in CIS 493, Senior Seminar, to evaluate the student's perceptions of the quality and relevance of the courses and program. This information was used to adjust the learning process in several of the CIS courses. In addition, the projects completed by CIS student teams in CIS 432, Senior Project, were evaluated for overall quality to determine if students had achieve the program learning outcomes and developed the skills needed to succeed in the IT work environment.

*Are the results being used for budgeting and strategic planning?*

The results of the CIS assessment processes are not currently used for budgeting or strategic planning, this will be changing. Assessment results will be used as an input into the next set of strategic plans (for 2012–2017). If funds are needed to address a learning outcome, this will be factored into future-year budgets (FY 11–12 and 12–13).

*How are results disseminated to faculty, students, advisory boards, and administrators?*

Faculty will learn of assessment results in faculty meetings attended by all faculty as well as through other means (email, memos, etc.). The Assistant Provost of Assessment and Student

Learning has been involved in assisting with the CIS program assessment processes, so she is knowledgeable about the state of assessment practice in the CIS program. We will continue to update her as more results are evaluated (i.e., more learning goals are assessed). We can improve the degree to which we provide feedback on assessment results to our boards and to our students.

*Are students informed about their progress toward the learning outcomes?*

Students are not directly informed about their progress toward learning outcomes. Our goal is to begin to shift students' awareness and perceptions relative to the CIS program's assessment activities. Currently, students think about their degree attainment from a "check off the boxes" mentality, meaning they concentrate on completing courses required in the curriculum of their particular degrees. What we aspire to achieve is for students to have two goals: (a) to complete the courses required for the degree they are seeking, and (b) to master the learning outcomes that must be achieved to graduate with a degree from the CIS program. In other words, we want students to be at least as concerned with mastering important skills as they are about completing course work and attaining a certain GPA. We are aware that a few universities (e.g., Alverno College) have shifted to this approach, and we believe we can benefit from their "lessons learned." We expect that we could begin planning for this "paradigm shift" in our approach and our students' focus during the 2011–2012 academic year.

### **Continuous Processes**

*What processes are in place to ensure that the academic program assessment plan is periodically reviewed, evaluated, and updated when appropriate?*

We are developing a comprehensive set of planning and tracking documents which describe when we will assess each of our learning outcomes, who will be involved, and what artifacts will be used.

*Who is responsible for initiating and supporting the on-going process of program improvement?*

The HSB Dean and CIS faculty are the primary initiators and supporters of the assessment process. Because the CIS program faculty and staff are heavily involved in and are primary implementers of improvement actions, the CIS program assessment process is highly collaborative.

*Who is responsible for ensuring that results from each year are the basis for action plans for the following year?*

The HSB Dean and the CIS faculty will be responsible for overseeing that assessment results are followed up with appropriate actions. In terms of implementing the actions (i.e., closing the loop), the HSB's Undergraduate Committee is responsible for helping direct any curriculum changes with appropriate faculty.

*What are some of the CIS program's goals for the next few years regarding assessment, student learning, and process improvement?*

The CIS faculty and the HSB Dean believe that the following goals are worth pursuing:

- getting better at identifying root causes and contributing causes of student learning shortcomings (i.e., unmet outcomes);

- becoming more adept at taking focused, robust, appropriate action to address shortcomings (rather than “scattered” assortments of low-effect actions or time-consuming discussions of contributing causes over which we have little or no control);
- continuing to build faculty understanding of assessment processes and the value of those processes;
- formally incorporating assurance of learning contributions as an expected job duty that is specifically addressed as part of the annual performance review (APR) within the category *service*;
- continuing the transition we have begun toward a culture focused not only on inputs (what we teach, courses that must be completed), but also focused, to a large extent, on outcomes (student capabilities at graduation);
- continuing to refine assessment processes and documentation for greater efficiency, clarity, usefulness, and efficacy;
- implementing a procedure faculty should follow when reviewing artifacts, specifying what they should do before, during, and after the review;
- experimenting with useful involvement of students in assessment processes;
- developing and refining rubrics to do a better job of capturing the essential and most meaningful differences between students who exceed, meet, and do not meet expectations on learning goals;
- pilot-testing the SALG (student assessment of their learning gains); and
- determining a useful way to communicate to students which learning outcomes each course in our curriculum addresses.



CIS Program Assessment Plan Summary

Date Submitted: May 23rd, 2017

For Academic Years: 2012-2017

CLASS	PROBLEM SOLVING			COMMUNICATION		TEAM SKILLS			ETHICAL AWARENESS		
	1.1 Analysis	1.2 Design	1.3 Implement & Maintenance	2.1 Written	2.2 Oral	3.1 Participation	3.2 Leadership	3.3 Contribution	4.1 Identify ethical issue	4.2 Identify ethical alternatives.	4.3 Recom- mend appropriate actions.
CIS 150 Computer Information Systems									fall 2015 case study in final 50% exceeds expectations and 50% meets expectations	Spring 2016 case study in final 90% exceeds expectations and 10% meets expectations	
CIS 171 Intro to Java Programming											
CIS 185 PC Architecture											
CIS 240 Object-Oriented Analysis and Design	2012 Assignment (Y.L.)	2012 Assignment (Y.L.) I			Fall 2015 group presentation 25% needs improvement, 60% meets expectation, and 15% exceeds expectation.						
CIS 271 Adv. Program Design with Java		2012 (J.C.)	2012 (J.C.)								
CIS 289	2012 Case	2012 Case			Fall 2016						

<b>Network Concept</b>	Study (T.N.)	Study (T.N.)			CIS289 Term Proj. Presentation 98% meet or exceed expectation						
<b>CIS 311 Intro to Web Development</b>		2012 Project (R.H.)	2012 Project (R.H.)								
<b>CIS 315 UNIX Operating System</b>											
<b>CIS 350 Database Management</b>		2012 (J.M.?)	2012 (J.M.?)		Spring 2016 group presentation 20% needs improvement, 65% meets expectation, and 15% exceeds expectation 90% meet or exceed expectation						
<b>CIS 432 Senior Professional Project</b>	2014 (R.H.) 100% M.E.  2015 Project report/slides/applications (R.H.) 100% M.E.	2014 (R.H.) 62% M.E.  2015 Project report/slides/applications (R.H.) 100% M.E.	2014 (R.H.) 78% M.E.  2015 Project report/slides/applications (R.H.) 100% M.E.	2014 (R.H.) 1  2015 Project report/slides/applications (R.H.) 100% M.E. Need to improve making references	2014 (R.H.) 66% M.E.	2014 (R.H.) 90% M.E.  2015 Student peer review (R.H.) 82%M.E.	2014 (R.H.) 57% M.E.  2015 Student peer review (R.H.) 65% M.	2015 Student peer review (R.H.) 82% M.E.	Spring 2017 Case study 100% meet or exceed expectation	Spring 2017 Case study 95% meet or exceed expectation	Spring 2017 Case study 90% meet or exceed expectation