## Computer Animation and Game Development Program Assessment Plan

Computer Animation and Game Development (CAGD) is a unique and relatively new program in the California State University system. The focus of our curriculum and students is on the very dynamic computer graphics industry. Evaluating and upgrading our program is essential the continued success and growth of the program. Being relatively new, we are evolving the plans and process for continuous program improvement. Our process plan is adapted from the process for assessment and improvement from the Accreditation Board for Engineering and Technology (ABET). This 2-loop process (Figure 1) provides us with a framework to structure our assessment and improvement process.

Figure 1: Evaluation and Assessment Cycles
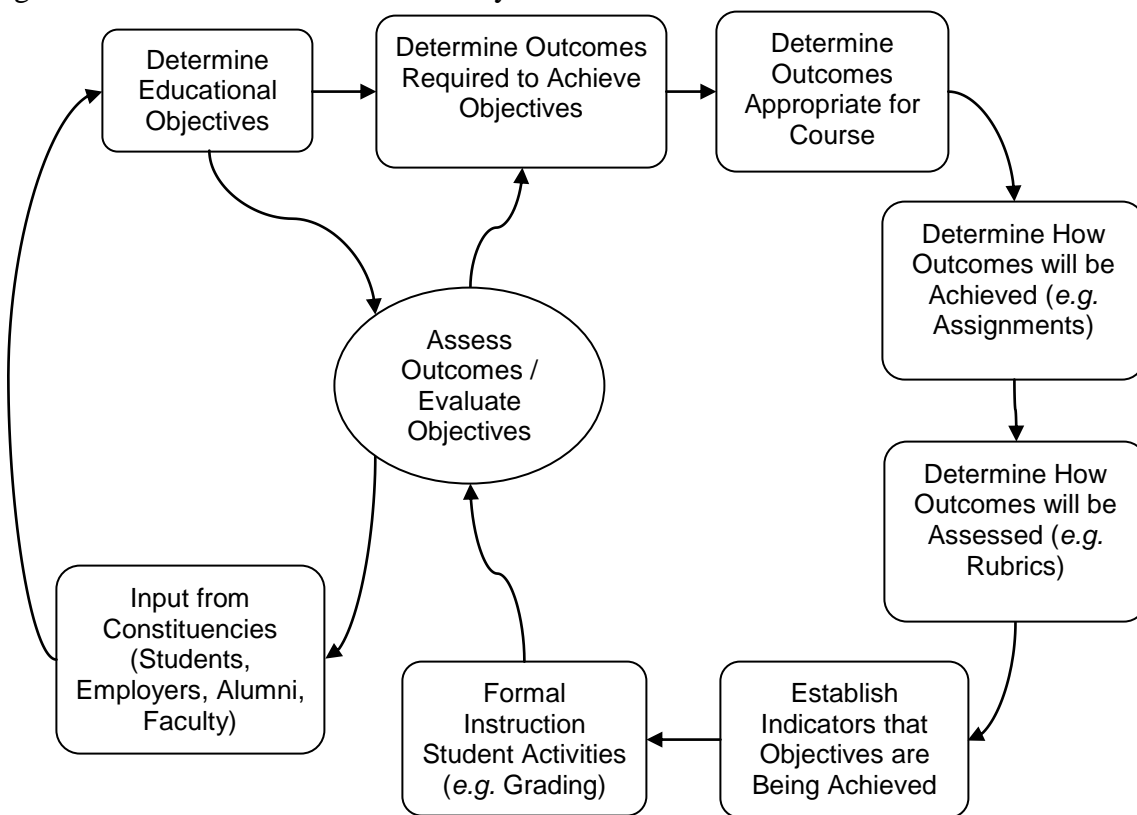
The left loop focuses on program objectives and the right loop on program outcomes. Each loop is iterative and feed into one another. Together the two loops help verify and improve the program's objectives and outcomes.   To start the process, the initial objectives for the graduates were defined by the faculty (Determine Educational Objectives). After the initial objectives were define, an initial set of measureable program outcomes were also defined by the faculty (Determine Outcomes Required to Achieve Objectives). With these program outcomes, the faculty evaluate the curriculum determining what existing curriculum contain components that correspond to the program outcomes as well determine in changes in the curriculum are necessitated to achieve the program outcomes. The faculty also review other means to monitor the program outcomes such as surveys, examinations, performances, external project reviews, *etc*. Within the curriculum, the faculty determine which courses introduced, practiced or

demonstrated mastery of each program outcome. Continuing with the refinement, the faculty review assignments or create assignments to measure the program outcomes (Determine How Outcomes will be Achieved) in the corresponding courses, and then create measurement rubrics to collect assessment data (Determine How Outcomes will be Assessed). The faculty determine what indicators will be used to demonstrate that the outcomes are being met (Establish Indicators that Objectives are Being Achieved). With the completion of these steps, the actual instruction and student assignments are conducted and graded based on these rubrics and indicators (Formal Instruction Student Activities). Corresponding steps are taken by the faculty to establish the means to measure the program outcomes in the non-curricular tools (i.e. surveys, examinations, *etc*.) The data from all these measures are then collected and assessed (Assess Outcomes / Evaluate Objectives). The results of the assessment and evaluation then fed into the left loop with constituencies (Input from Constituencies) reviewing the data and providing input for the faculty to review and update any of the educational objectives. The results of the assessment and evaluation along with any update to the educational objectives the program objectives feed back into the right loop with the faculty revisiting the program outcomes as necessary. The process continues revolving around these tasks to evaluate and improve the program.

The CAGD Program Improvement Process

Continuous evaluation and improvement are essential to the CAGD program so that the program meets the needs of students, university, and employers. To facilitate this continuous evaluation and improvement, the CAGD program has created a Program Improvement Process (PIP) based on the mission statements of the University, College and Program.

1. Setting Program Educational Objectives

With the initial objectives set by the faculty to prime the process, the mechanisms are now in place to garner input from a larger constituent pool. This pool of constituents includes faculty, employers, alumni and students. The starting point for setting the objectives was the program's mission statement for which the faculty reviewed the University's and the College's mission statements.

The University mission statement:
> "California State University, Chico is a comprehensive university principally serving Northern California, our state and nation through excellence in instruction, research, creative activity, and public service.
>
> The University is committed to assist students in their search for knowledge and understanding and to prepare them with the attitudes, skills, and habits of lifelong learning in order to assume responsibility in a democratic community and to be useful members of a global society."

The College mission statement:
> "We prepare students for successful professional careers in applied science and technology. We educate them to be successful leaders and innovators capable of meeting complex challenges."

Based on these mission statements and faculty input as to the direction and focus of the program, the CAGD mission statement was developed.

Computer Animation and Game Development mission statement:

> We prepare students for successful professional careers in the computer graphics fields through our innovative program based on the synergy of art and technology. Through applied-learning and collaborative environments embracing industry-standard technical and conceptual techniques, we provide the foundation for creative expression and life-long learning that leads our students to be successful and effective contributors, leaders and innovators capable of overcoming complex challenges**.**

With the mission statement in mind, the faculty then defined what the initial objectives of the CAGD Program. The objectives were discussed at several meetings of the entire faculty and a draft objective was defined. That draft was provided to all the faculty and they were asked to review the objectives. This process lead to the following objective statements:

The objective of the Computer Animation and Game Development Program is to produce graduates able to:

- Computer Animation and Game Development graduates will have an understanding of critical and aesthetic issues in computer graphics and mixed-media.
- They will know basic aesthetic principles and concepts, and the production process.
- They will be able to effectively use technical, conceptual and critical abilities, and appropriate technology tools.
- They will be effective written and oral communicators with the ability to function as effective members of collaborative multi-disciplinary teams in the production process.
- They will be able to critically evaluate computer graphics and the mixed media.
- They will have an appreciation for the professional code of ethics for the creative process.

Now that the mission and objectives of the CAGD program have been defined, they will be reviewed at least once every five years by the program's constituents. The program coordinator will solicit input from the following groups:

- Faculty – faculty who teach at least 4 courses per year.
- Employers – represented by employers of our graduates participating in the employer survey.
- Alumni – represented by alumni participating in the employer survey.
- Students – represented by Computer Graphics Club and other interested students.
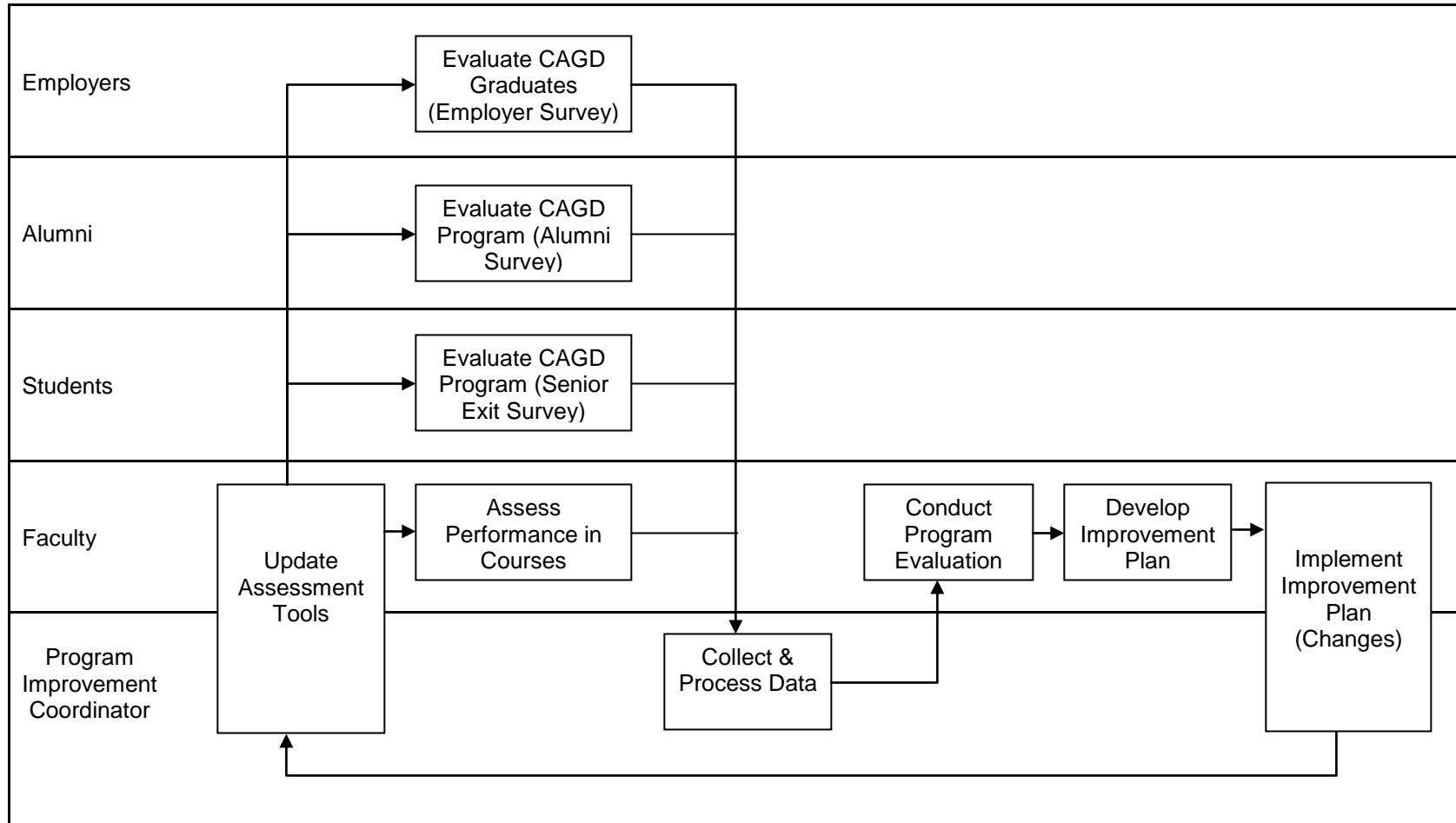
The faculty, as a whole, evaluate the inputs to determine if any changes in the objectives are warranted. If changes are made, the assessment plans are updated and the effectiveness of these changes will be evaluated through the assessment and improvement process.

2. Measuring Achievement of Program Educational Objectives

To verify that the educational objectives of the program are being satisfied, the program is responsible for assessing its graduates through the Program Improvement Process. The process is continuous with asymmetrical input dependent on measurement instruments scheduled for a particular year. The CAGD's Program Improvement Process is depicted in the Figure 2 begins

each academic year with a review of the assessment tool(s) that will be used to gather that year's data. The faculty in concert with the program improvement coordinator may elect to update or replace a given assessment tool. The data from these assessment tools must be collected from one or more of the sources (employers, alumni, students, and faculty). The data is collected and processed by the program improvement coordinator. The processed data is then reviewed by the faculty to determine what, if any, changes should be considered with a Change Improvement Plan being developed if changes are indicated. Once a Change Improvement Plan has been developed, it is distributed to the faculty for implementation.

Figure 2: CAGD Program Improvement Process

Employers	Evaluate CAGD Graduates (Employer Survey)			
Alumni	Evaluate CAGD Program (Alumni Survey)			
Students	Evaluate CAGD Program (Senior Exit Survey)			
Faculty	Update Assessment Tools → Assess Performance in Courses	Conduct Program Evaluation → Develop Improvement Plan →	Implement Improvement Plan (Changes)
Program Improvement Coordinator	Collect & Process Data		

3. Assessment of Program Outcomes

The CAGD faculty developed the initial program outcomes based on the program's mission and objectives. These outcomes specify the capabilities that every graduate from the program should have at the time of graduation from the CAGD program.

Mapping Required Courses to Program Educational Outcomes:

The faculty reviewed program outcomes and correlated these with the curriculum and course assignments to develop a mapping of CAGD core courses with the program outcomes. Table 1 shows this mapping as of Fall 2017. Every required core course in the program supports at least one program outcome. A course may support a program outcome by introducing the material related to the outcome (Introduced), giving students the opportunity to practice applying concepts, methods and techniques necessary to develop proficiency in the program outcome (Practiced), or by measuring how well the student has mastered the program outcome (Demonstrated at the Mastery Level). As can be seen in the table every program outcome is mapped to multiple courses to ensure that students have multiple chances to learn how to master each program outcome and to graduate from introduction to practice before need to demonstrate mastery. By use of embedded assessment, each program outcome is assessed in each corresponding course. Thus the program gathers information from assessment in introductory, practiced and demonstrated mastery level.

Table 1: Mapping Core CAGD Courses to Program Learning Outcomes

Course Title	Course	Issues	Aesthetic	Abilities	Proficiency	Written	Oral	Critiquing	Teams	Process	Professionalism
		1	2	3	4	5	6	7	8	9	10
Computer-Assisted Art	110	I	I	I	I	I				I	
Digital Photography	112	I	P	P	P	I		I		I	I
Concept Design & Storyboarding	117	I	P	P	P	P	P	I	I	I	I
Video Game Design	170	I	P	P	P	P	P	I		I	I
Digital Modeling	230	I	P	P	P	P	P	I		I	I
Digital Animation	240	I	P	P	P		P	I		I	
Motion Capture for Game	325		P	P	P				P	P	
3-D Computer Modeling	330	P	P	P	P	P	P	P	P	P	I
3-D Character Modeling	331	P	P	P	P		P	P		P	P
Computer Animation	340	P	P	P	D			P		P	P
Advanced Animation Pre-Prod	345	P	P	P	P	D	D	D	P	P	P
Digital Lighting and Texturing	420		D	D						D	
3-D Character Rigging	432		D	D						D	
Advanced Animation Production	445	D	D	D	D		D	D	D	D	D
Senior Portfolio	493	D	D	D	D		D	D		D	D
Advanced Animation Post-Prod	545	D	D	D	D		D	D	D	D	D

Embedded Assessment Components:

Components within each assignment these courses are utilized to address the corresponding program outcome. These components are used to measure, on average, student proficiency at achieving the program outcome. With multiple courses providing assessment of the program outcomes, the program is not dependent on a single course to provide the students with the material or for a single course to assess the program. Because successive courses build on the material of prior courses, it important to assess the preceding courses to measure the effectiveness of student learning. Also the assessments at the demonstrate at mastery level are not exclusively a metric of learning in that course, but a collective result of all prior courses for which each program outcome is a component. The measure of program outcome assessment varies as appropriate to the course, assignments and to the program outcome. The program faculty review assessment summaries on an annual basis. Course, assignment, and programmatic changes are considered as applicable by the faculty, and the effectiveness of the assessment is also evaluated and modified as warranted. The assessment components include:

> **Metric:** *The measure of student proficiency using quantitative or qualitative measure of achievement on an assignment or test question which emphasizes the target program outcome.*

> **Rubric:** *Descriptions of achievement levels for each metric. For most metric the rubric adopted by CAGD utilizes four (4) levels representing unacceptable, marginal, acceptable and exceptional.*

> **Evaluation:** *Evaluative conclusions versus corresponding descriptions of achievement level.*

> **Standard:** *Evaluative result that represents minimally acceptable achievement of proficiency.*

The assessment metric used for programmatic assessment is also used to assess achievement by individual students.

4. Timeline for the Assessment/Program Improvement Process

The annual cycle of program assessment and program improvement activities is distributed across the academic year (Table 2). The embedded assessment tools within the curriculum are conducted every semester in each academic year. The senior survey is used each semester for graduating seniors. The alumni and employer survey instruments are used at least annually. The assessment outcomes are generated by the program improvement coordinator each semester and reviewed by the faculty each semester. The assessment outcomes are to be reviewed by other constituents on an annual basis. In the beginning of the Fall semester the faculty and the program improvement coordinator develop changes to the improvement plan and update assessment tools. Implementation of any changes occurs during the academic year.

Table 2: Assessment and Program Improvement Plan Annual Cycle

	Changes to Improvement Plan	Implementation of Changes to Improvement Plan	
Assess-ment Outcomes	Assessment Outcomes Faculty Review	Assess-ment Outcomes / Assessment Outcomes Faculty Review / Assessment Outcomes Other Constituents Review	
		Senior Survey	Alumni Survey / Employer Survey / Senior Survey
	Embedded Assessment	Embedded Assessment	

July	August	September	October	November	December	January	February	March	April	May	June

The CAGD faculty and program improvement coordinator selected to deploy the assessment components in a sequential ramped implementation. Thus with the overall plan and process in mind, segments are added to the implementation each year. The selection of the sequential implementation allows the faculty to develop strategies for the implementation and not overwhelm the faculty, students or program improvement coordinator.