Annual Report for Assessment of Outcomes 2012-13

Subject Area Committee Name: Computer Aided Design and Drafting

Contact person: Glen Truman

For LDC/DE: Core outcome(s) assessed: _____

For CTE: Degree or certificate* assessed: Less than one year Certificate

*please attach a table showing the alignment of the degree or certificate outcomes with the College Core Outcomes

Please address the questions below and
send to *learningassessment@pcc.edu* by **June 21, 2013** with Annual Report in the subject line

Note: Information provided in this report may be inserted into or summarized in Section 2C Program Review Outline.

1. Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from recent outcome assessments. These may include but are not limited to changes to content, materials, instruction, pedagogy etc. Please be sure to **describe the connection** between the assessment results and the changes made.

Students need to be prepared to comply with standards present in industry using Computer Aided Drafting with several different software programs. These include AutoCAD 2013, Inventor 2013, and SolidWorks 2012. Companies use layers with different colors, linetypes, and lineweights to standardize their drawings. Standards of layers, linetypes, lineweights, and dimensioning standards were developed in 3 courses as a result of observing that students were not conforming to the same set of standards when submitting assignments. The courses were standards were implemented were DRF 133 Intermediate Drafting, DRF 135 Advanced Drafting and DRF 251 Kinematics Drafting.

For each outcome assessed this year:

2. Describe the assessment design (tool and processes) used. Include relevant information about:
   - The nature of the assessment (e.g., written work, project, portfolio, exam, survey, performance etc.) and if it is direct (assesses evidence mastery of outcomes) or indirect (student's perception of mastery). Please give rationale for indirect assessments (direct assessments are preferable).
   - The student sample assessed (including sample size relative to the targeted student population for the assessment activity) process and rationale for selection of the student sample. Why was this group of students and/or courses chosen?
   - Any rubrics, checklists, surveys or other tools that were used to evaluate the student work. (Please include with your report – OK to include in appendix). Where appropriate, identify benchmarks.
   - How you analyzed results, including steps taken to ensure that results are reliable (consistent from one evaluator to another.

The nature of the assessment was student assigned drawings with direct assessment of submitted work. All students in each course were assessed with between 18-22 students. The rubric used in the assessment process was in layers being created in AutoCAD 2013 software.

The following is the standard students were to use:

Layer Name	Color Name	Linetype	Lineweight
CENTER LINES	red	CENTER2	0.25mm
DIMENSION LINES	cyan	Continuous	0.25mm
HIDDEN LINES	magenta	HIDDEN	0.25mm
OBJECT LINES	green	Continuous	0.53mm
TEXT	yellow	Continuous	default
TITLEBLOCK	white	Continuous	0.90mm

The following is the dimensioning standard the students were to use:

DRF 133 INTERMEDIATE DRAFTING

DIMENSIONING STANDARDS

Create a text style named **DRF 133 TEXT**. Assign the font name **ARIAL**, font style bold.

In the **Style** dialog box found in the **Dimension** menu; or type **D**, enter:

a. Create a new dimension style called **DRF 133 DIM.**

b. In the **lines** tab set:

1. **Dimension Line**
   a. **Color:** No change.
2. **Extension Line**
   a. **Color:** No change.
   b. **Extend beyond dim lines:** change to 0.09
   c. **Offset from origin:** leave at 0.06

c. In the **Symbols and arrows** tab set:

1. **Arrowheads:**
   a. **1st** and **2nd:** use **Closed filled.**
   b. **Size:** change to 0.15
   c. **Center marks:** change to line

d. In the **Text** tab set:

1. **Text style:** change to **DRF 133 TEXT**.
2. **Color:** No change.
3. **Text height:** change to 0.10
4. **Vertical text placement:** Centered.
5. **Horizontal text placement:** Centered.
6. **Text alignment:** Horizontal.

e. In the **Fit** tab set:

1. **Text placement:** No change.
2. **Scale for dimension feature:** No change.
3. **Fine tuning:** No change.

f. In the **Primary Units** tab set:

1. **Unit format:** No change.
2. **Precision:** 0.00
3. **Zero suppression:** suppress leading

3. Provide information about the results (i.e., what did you learn about how well students are meeting the outcomes)?
    - If scored (e.g., if a rubric or other scaled tool is used), please report the data, and relate to any appropriate benchmarks.
    - Results should be broken down in a way that is meaningful and useful for making improvements to teaching/learning. Please show those specific results.

Using the above standards, the students submitted drawings were assessed. If there were deviations from the standards on the first submitted drawing, and/or omissions of elements required, deviations were noted on the drawing and there was a grade penalty assessed. If on the re-submission of the drawing the corrections were not completed as noted, such as a correction being missed, this was also noted, and another grade penalty was assessed. As a result there were a rather large percentage of students that did not adhere to the standards at first. When they began to see the grade penalty being assessed, they took more care before submitting their assignments. The percentage of students that needed grade reductions was 38%. This seemed rather high. Typically in industry a drafter works on a project drawing and submits it to a drawing checker who marks the drawing with red lines for corrections of errors or omissions. The assessment rubric was intended to emulate for the student what they should expect on the job, stressing the importance of working to standards.

4. Identify any changes that should, as a result of this assessment, be implemented to help improve students' attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).

It was found that the full and adjunct instructors in the certificate program use some form and variation of the standards in relationship to their own course instruction, so true consistency was difficult to attain. It was determined that a department standard should be agreed upon by the full and part time instructors to be applied across the curriculum. This should improve students' attainment of the College Core Outcome of:

Professional Competence:

Demonstrate and apply the knowledge, skills and attitudes necessary to enter and succeed in a defined profession or advanced academic program.

5. Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.

The assessment tool and assessment process are valid in preparing students for what they would experience in the industry they are receiving training for. As stated above a department standard that is developed and

implemented in all courses in the certificate program would result in a consistent assessment process that would reinforce the standards to the students improving the students' attainment of the outcome.

The outcomes of the Computer Aided Design and Drafting Certificate Program are:
At the conclusion of the Certification program, the student will be able to:

- Use current Computer Aided Design technology to design, and subsequently print, two-dimensional industry standard drawings.
- Use a variety of advanced parametric Computer Aided Design software applications to design, and subsequently print, three-dimensional parts, assemblies, and sub-assemblies.
- Use American National Standards Institute guidelines when designing and producing drawings.
- Work as an integrated member of a drafting technology design team, collaborating on concepts and ideas related to a working project.
- Apply a generalized understanding of design principles involving trigonometry and geometry when solving drafting design problems.

Of these there are three Core Outcomes that align with the certificate outcomes:

Critical Thinking and Problem Solving:

Identify and investigate problems, evaluate information and its sources, and use appropriate methods of reasoning to develop creative and practical solutions to personal, professional and community issues.

Professional Competence:

Demonstrate and apply the knowledge, skills and attitudes necessary to enter and succeed in a defined profession or advanced academic program.

Self-Reflection:

Assess, examine and reflect on one's own academic skill, professional competence and personal beliefs and how these impact others.