

Annual Report for Assessment of Outcomes
(For Degree, Certificate or Core Outcomes)
Aviation Science (AVS)

To complete this Assessment Report, please address the questions below, and send to learningassessment@pcc.edu **by June 20, 2011**; subject line: REPORT Assessment [AVS]

1. Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from outcome assessments carried out in the previous academic year.
2. Identify the outcomes assessed this year, and describe the methods used. What were the results of the assessment (i.e., what did you learn about how well students are meeting the outcomes)?
 - a. **Describe the method(s) you used.**
 - b. **Results: What did you learn?**
3. Identify any changes that should, as a result of this assessment, be implemented towards improving students' attainment of outcomes.

In 2010-'11, our SAC was supposed to report on the *Critical Thinking & Problem Solving* core outcome. We did not report on this outcome during the 2010-'11 academic year, and so are assessing the results of this outcome this year. Any changes to content, materials, pedagogy, or other items will be implemented in the 2011-'12 academic year.

We have mapped our degree and certificate outcomes to each of the six PCC core outcomes, and have identified in which of the Aviation Science classes those core outcomes could best be assessed (see table below). By mapping all of our AVS classes to the core outcomes and degree outcomes, we can better identify areas that are not given as much attention (such as cultural competence), and make changes to curriculum, if necessary.

During the 2010-'11 academic year, we chose to assess how the core outcomes of *Professional Competence* and *Critical Thinking & Problem Solving* were being addressed in the Aviation Science program. We also began gathering work samples that will be used in the 2011-'12 academic year for future evaluation.

1. Outcome (* Perkins recipient – TSA)	2. Maps to a Core Outcome?	3. Assessment Setting/Method	4. When will assessment take place ?
<p>Earn FAA certificates and ratings appropriate to the pilot career they seek.</p> <p><i>For Airplane degree:</i></p> <ol style="list-style-type: none"> Commercial Pilot certificate with airplane single- and multi-engine and instrument airplane ratings. Flight Instructor certificate with airplane single- and multi-engine and instrument airplane ratings (If Flight Instructor specialization is chosen). <p><i>For Helicopter degree:</i></p> <ol style="list-style-type: none"> Commercial Pilot Certificate with Rotorcraft Helicopter and optional Instrument Helicopter rating. Flight Instructor Rating with Rotorcraft Helicopter rating. 	Professional Competence	<p>All students are required to take an FAA Airman Knowledge Test and Airman Practical test to receive certification as a pilot. The FAA sets areas of assessment and standards for passing each exam.</p> <p>Students will provide their passing rate for each knowledge and practical test upon completion of a flight class that results in an FAA license, rating or certificate.</p>	2010-'11
<p>Gain additional knowledge and skills related to the aviation industry and acting as a professional pilot that are above and beyond the FAA certification requirements and will allow them to be safer, more effective pilots and be competitive in the pilot job market.</p>	Communication	Assessed in AVS-127, AVS-227 by evaluating presentation of final projects.	2011-'12
	Community & Environmental Responsibility	Assessed in AVS-127, AVS-267 by examining final projects.	2011-'12
	Critical Thinking & Problem Solving	Assessed in AVS-237, AVS-267 by examining final projects.	2010-'11
	Cultural Awareness	Assessed in AVS-127, AVS-267 by examining final projects.	2011-'12
	Professional Competence	Assessed in AVS-137, AVS-157, AVS-167 by examining raw scores from midterm & final exams.	2010-'11
	Self-Reflection	Assessed in AVS-127, AVS-227 by examining final projects.	2011-'12
<p>Explore areas in math, writing, general education and approved elective course work that will allow them to function more effectively as an aviation employee and/or continue their education towards advanced degrees.</p>	<p>Communication Community & Environmental Responsibility Critical Thinking & Problem Solving Cultural Awareness Self-Reflection</p>	<p>Not sure yet where or how to assess core outcomes in classes from other departments.</p>	

Professional competence: Assessment method

To evaluate *Professional competence*, we chose to look at the flight classes, ground schools, and some of the 100-level Aviation Science courses of a more technical nature. For the flight classes and ground schools, we asked students to self-report their first-time pass rate for FAA checkrides and knowledge tests. For the 100-level classes (which include AVS-157: Aircraft Systems – Airframe, and AVS-167: Aircraft Systems – Powerplant), we looked at the relationship in scores from the two midterms to the final exam.

Flight classes and ground schools:

During the first two weeks of May 2011, we asked students who were registered for a flight lab to take an anonymous survey through Desire2Learn. The survey asked students to report how many attempts it took them to successfully complete any FAA checkrides or knowledge tests they took in the past year. Checkrides are performance-based, and students must successfully complete a number of tasks in order to pass. Knowledge tests are computer-based, multiple-choice tests that directly relate to tasks students are tested on during checkrides. Most checkrides require the student have passed a corresponding knowledge test before attempting the checkride.

Students are required to register for a flight lab when they are currently engaged in flight training – looking at the enrollment for a flight lab gives a cross-section of flight students for a given term. The flight labs have a mixture of airplane and helicopter students at all stages of training and at all stages of degree completion. During spring term 2011 (when the survey was administered), there were 100 students registered for the four flight labs. Out of those students, we received usable data from 57 surveys. Results were tabulated by hand.

100-level Aviation Science classes:

At the end of spring term 2011, gradebook data was collected from sections of AVS-157 and AVS-167. Scores from the first attempts at the midterms and final exams were compiled into a spreadsheet, and identifying student information was stripped. The midterms and final exams in these classes were composed primarily of multiple-choice questions, with some fill-in-the-blank and drawing questions.

Professional competence: Assessment results and changes

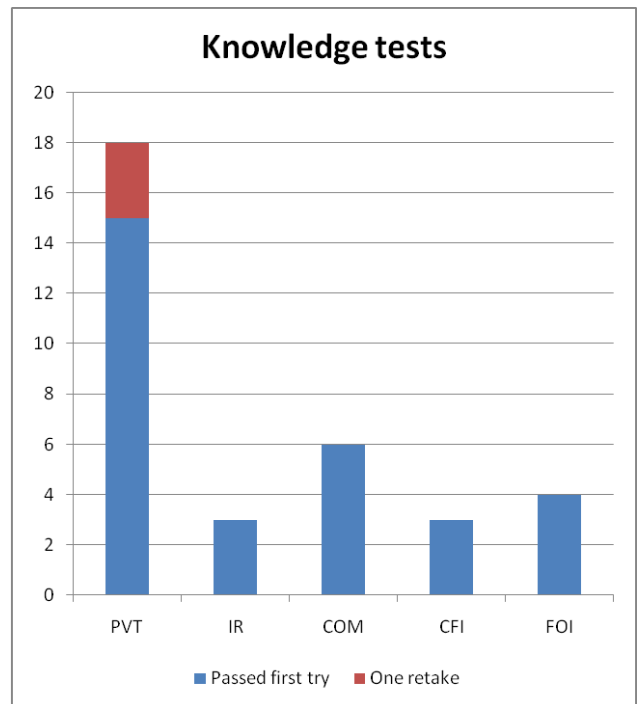
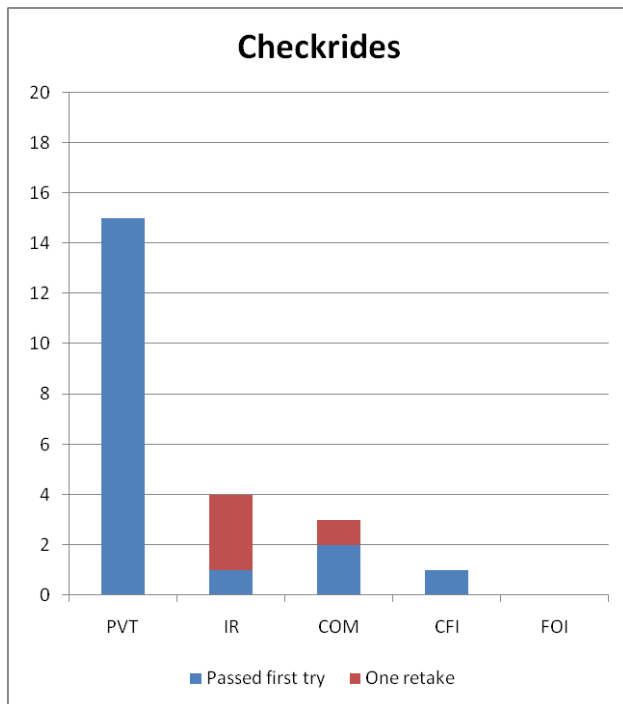
Data self-reported by participating students indicated that a majority of students are passing their checkrides on the first attempt, which would indicate at least an industry-wide minimum standard of professional competence (see tables below). Generally, how many attempts a student takes to pass an FAA checkride does not have a significant impact on their aviation career, as long as they do eventually pass. However, a pattern of repeatedly failing checkrides can indicate either a student who is not properly prepared for the exams, or who needs additional guidance of some sort (such as counseling for testing anxiety) before attempting the next checkride.

It appears that the instrument checkride and the private knowledge test require one retake to pass more often than other checkrides or knowledge tests. Neither of these is surprising, as the instrument checkride is composed of a fairly challenging set of tasks, and students taking the private knowledge test have no previous experience taking an actual FAA knowledge test. Knowing this, however, we could encourage all students, particularly private and instrument students, to do additional practice exams before attempting their knowledge tests, or to talk to other students before going for an instrument checkride to try to become better prepared.

In future surveys, it would be more useful to ask students about all checkrides or knowledge tests they have taken *while at PCC*, rather than limiting their focus to just the previous year. This would give a more robust picture of how our students are doing. Many students indicated that they had passed a more advanced checkride during the previous year (such as the commercial or flight instructor), but did not provide results from more basic checkrides that may have been taken in previous years. Gathering this additional data, as well as the date they took their checkrides, would provide additional useful information to the department.

Changing the survey from a narrative form to one with radio buttons or checkboxes might also help gather more complete, correct information – some students mis-read the directions and reported scores from intermediate progress checks rather than final FAA checkrides.

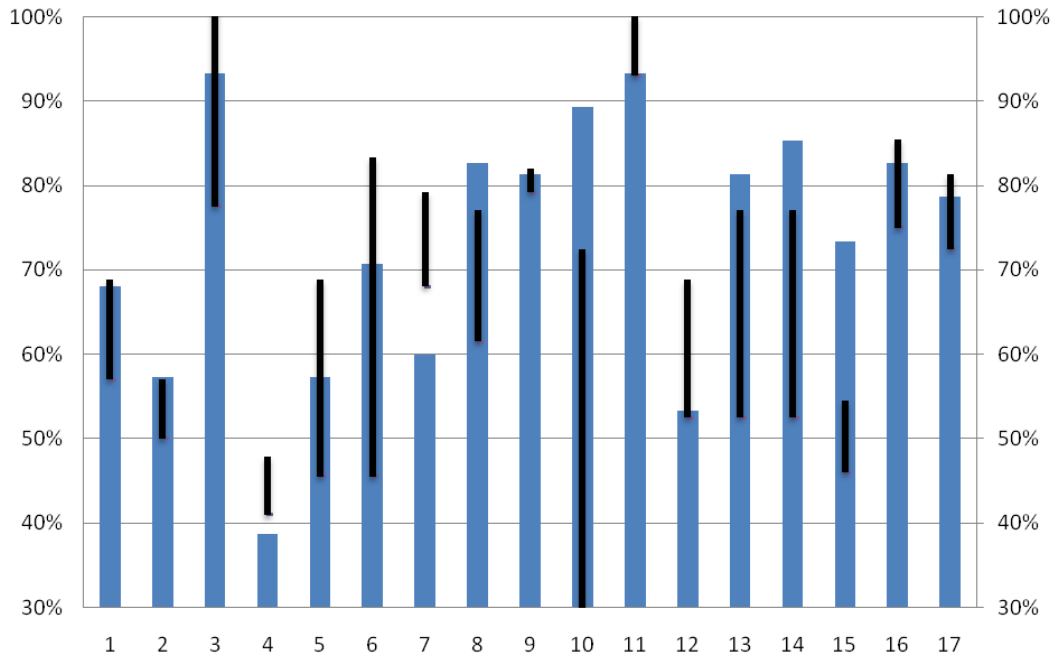
It would also be more useful in the future to do individual student interviews, or non-anonymous surveys, to gather data about intermediate progress checks and compare that with the student’s attempt at FAA checkrides. This would also give us additional information about whether these checkrides and knowledge tests were for airplane or helicopter category ratings, further allowing us to refine our study recommendations to students. Our department issues grades for flight classes based not on final FAA checkrides, but on successful attempts at progress checks, so students already report this data to us. Gathering this information would allow our department to focus on problem areas, and progress checks that students seem to have more trouble in passing the first time.



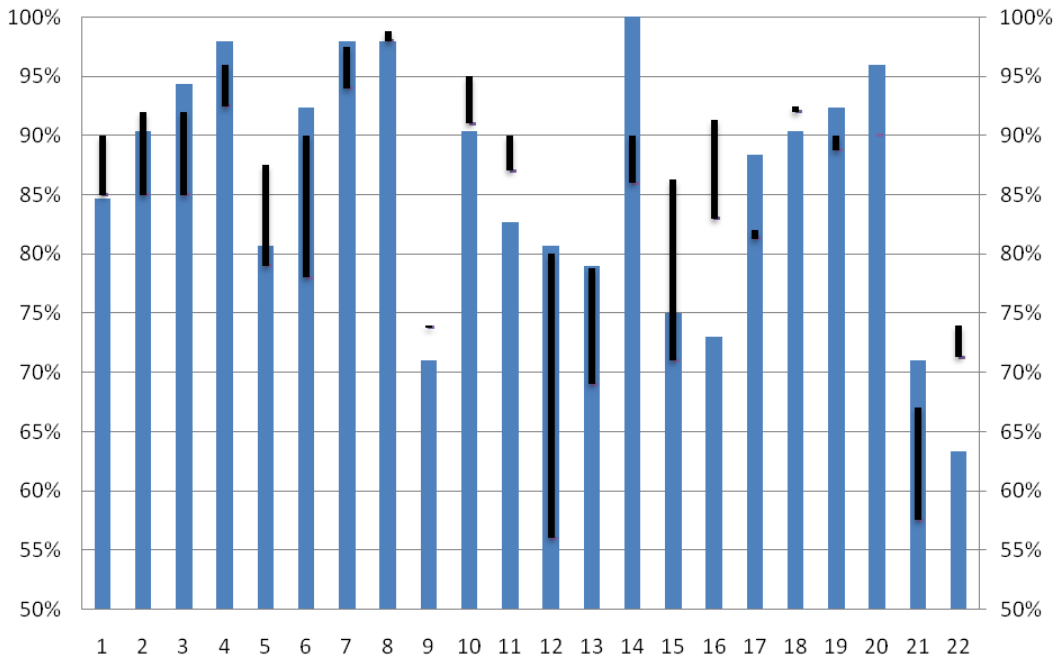
Data collected from AVS-157 and AVS-167 was inconclusive (see tables below). Initial feedback received on our assessment plan from the Learning Assessment Council indicated that looking purely at the relationship between scores on the midterms and the final does not provide a very robust indication of whether or not students are actually learning the information, and after going through the assessment process, we agree. If the midterms and final exams contained identical information, this might be true, but each of the exams covered slightly different information. For example, the first midterm in AVS-167 covered primarily electrical systems, and contained one complex problem worth a significant portion of the exam, that many students missed. The problem was not repeated on the second midterm, so measuring any improvement in scores is relatively arbitrary. One would hope that students are continuing to learn and improve their study skills over the course of a term, but simply measuring scores on exams does not provide adequate information to assess overall learning.

For future assessment of the effectiveness of these classes, and of their effectiveness in teaching professional competence in particular, implementing a more open-ended component to the final, or some sort of narrative project requiring each student to pull together many different knowledge areas, might be a more appropriate assessment tool. We will continue to explore options as a department over the next several years, and discuss possibilities during upcoming SAC meetings.

**Range of midterm scores vs. final exam score
AVS-157**



**Range of midterm scores vs. final exam score
AVS-167**



Critical thinking and problem solving: Assessment method

To evaluate *Critical thinking & problem solving*, we chose to look at the final project in one of our 200-level Aviation Science classes (AVS-237: Aviation Law & Regulations). Students in this class are typically toward the end of their flight training and degree program.

The final project for Aviation Law & Regulations consisted of several parts. The parts we chose to examine were a written critique, and preparation of a checklist. The critique required each student to individually locate an existing judicial hearing related to a pilot who was accused of violating regulations, and analyze what lessons could be learned from the situation. Creation of the checklist required each student to individually analyze complex regulations related to commercial flying and distill the information down to the essential pieces a company would need to comply with. Each student then created a checklist that an imaginary commercial aviation company could use to perform an internal audit to ensure compliance with those regulations.

Although students were given a specific grading rubric by which their projects would be graded during the class, this rubric took into consideration not just their ability to internalize the regulations but also their grasp of layout and organization. Thus assessment of the projects specifically for critical-thinking, for the purposes of this report, was more free-form and did not use a specific rubric.

Critical thinking and problem solving: Assessment results and changes

Overall, students did a good job identifying appropriate judicial cases to review – the exceptions were students who misread the directions for the assignment. Of students who picked the correct type of cases, responses were generally thoughtful and insightful. Responses conveyed an overall theme of respecting the regulations and keeping safety first and foremost. Several students expressed incredulity that pilots or companies would attempt to circumvent regulations, and indicated that they would not want to work in an environment where they were encouraged to break regulations or skirt around safety rules. This is precisely the type of attitude we hope to foster in our students, and it was encouraging to see them demonstrate it in this assignment. Although students in many of our Aviation Science classes currently examine judicial hearings and accident reports for “lessons learned,” it would be worthwhile to examine *all* of our classes and try to identify additional opportunities to incorporate relevant examples for student discussion and critique.

Responses to the checklist assignment were more varied in their quality. The best work samples were not only exceptional, but perhaps even overkill as far as the level of preparation the assignment was intended to get the students to think about. On the other end of the spectrum, the least-satisfactory work samples were copied and pasted from one of the reading assignments with apparently no thought as to how the student would have needed to use it in the “real world” – rather a disappointment considering that the real world is exactly where our students go after graduation. Although many of the exceptional examples came from students who had turned in exceptional work over the whole term, several of the final projects showed marked improvement from previous assignments that had also asked students to create a similar checklist related to different regulations. This would seem to indicate that offering more opportunities for students to practice analyzing complex regulations and breaking them down into meaningful pieces is good practice for students whose level of knowledge is not at the level we would like it to be. We will examine other assignments in this course and try to incorporate more analysis of complex regulations, and consider incorporating analysis of the regulations (rather than simple memorization) earlier in the degree program.