

***STUDENT OUTCOMES ASSESSMENT PLAN***

**Course Assessments**

**And**

**Program Reviews**

Dr. Jerry Standahl  
Office of Assessment and Institutional Research  
Paul D Camp Community College  
Franklin, Virginia 23851

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# Student Outcomes Assessment Plan

## Introduction

Paul D. Camp Community College's five-year Student Outcomes Assessment Plan was developed over a period of several years when the Virginia General Assembly mandated that all public institutions of higher education develop assessment plans to measure student achievement.

Assessment in higher education has become increasingly important as the nation debates educational effectiveness at all levels. Political and public pressure requires colleges to be held accountable for both the resources spent in higher education and the educational outcomes of those resources.

The primary goal of the College is to help students learn. In order to do this the material taught must be relevant, comprehensive, and current. The order in which the courses are sequenced in programs must be coherent. Course and program goals must be established and designed to prepare students to achieve their educational goals, whether that be employment or transfer. Classroom instruction needs to be supplemented with academic support services and the appropriate resources provided to create environments conducive to learning. The College also needs to validate that we are doing what we say we are doing and that students are learning what we say they are learning.

That is why the faculty do annual student outcomes assessment on courses, on the graduates in the academic program they are responsible, and general education (core competencies). Faculty also do a program review of their program every five years according to the five-year cycle. It is a lot of work, but it is something that good educators have always done on a continuing basis. The College wants the best for its students, and a program or discipline review gives the opportunity to examine what we are doing in a thorough and complete fashion.

## The Purpose of Assessment

Outcomes assessment is the process of collecting information that will tell an organization whether the services, activities, or experiences it offers are having the desired impact on those who partake in them. In other words, is the organization making a difference in the lives of the individuals it serves?

In higher education, at its simplest, outcomes assessment has three stages:

1. **Defining** the most important goals for students to achieve as a result of participating in an academic experience (outcomes)
2. **Evaluating** how well students are actually achieving those goals (assessment)
3. **Using** the results to improve the academic experience (closing the loop)

Enhancing quality through the improvement of instruction and student learning, as well as support services is the primary focus of all assessment activities at Paul D Camp Community College (PDCCC). The annual outcome assessment process is more qualitative and focuses on improving teaching by analyzing student learning outcomes. The program/discipline review process is more quantitative and focuses on the program/discipline as a whole, how effective it is, and that our students are learning. To achieve the above, some aspect of each program's goals

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and objectives needs to be assessed on an annual basis. All program and general education goals must be evaluated at least once within the five-year cycle (It is recommended that most or all student outcome assessments be completed by the end of the fourth year in the cycle so that the fifth year can focus mainly on the program review). There are the discipline reviews (e.g. developmental studies, dual credit, distance learning, student services, etc.) which are also reviewed every five years or as needed. (See Appendix B Program Review and Student Outcomes Assessment Schedule)

### **Student Learning Outcomes Assessment**

In summary, academic student outcomes assessment provides on-going (annual), faculty-based evaluation for the purpose of improving the quality of the college's courses/instructional programs and ensuring that outcomes achieved are consistent with the mission of the college. (See Assessment, Student Outcomes under Elements of Assessment and Program Review Reports):

- Is more qualitative and focuses on teaching through the analysis of student learning outcomes.
- Improves the quality of the college's instructional programs.
- Ensures that outcomes achieved are consistent with the mission of the College.
- Uses the results of the annual assessments and other data to determine the effectiveness of the program during the program review process.

### **Program/Discipline Review**

Through the review of our programs/disciplines (See Elements of Assessment and Program Review) we seek to demonstrate that:

- students are **learning** the knowledge, skills, and habits of thought necessary to achieve the program/discipline goals and objectives.
- the **program/discipline goals** are derived from and support the college mission and goals, the general education goals, and the purpose of the program/discipline.
- the **curriculum** is coherent, current and consistent.
- the **instruction** is effective in enabling student learning.
- the **resources** are adequate for the production of student learning.
- the academic **support services** are adequate to facilitate student learning.

Program/discipline reviews demonstrate that assessment results will be used in the improvement of student learning within the program/discipline. Program/discipline reviews also provide information essential to effective planning and budgeting as well as to the process of evaluating our effectiveness as an institution. Finally, the program review is an opportunity to look to the future, to consider where programs need to be in five years and to decide what needs to be done now to make sure programs will continue to meet the needs of students and employers in the future.

Effective instructional programs have certain common characteristics. First and foremost, effective instructional programs are focused on student learning and employ the best practices in curricular design and instructional modalities. Effective programs require continual assessment of student learning and provide ready feed-back to students about their learning. Effective

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programs create a learning environment that provides access to learning for all students.

### Who Benefits from Outcomes Assessment?

One of the great advantages of outcomes assessment is that when done in a systematic way, it has benefits for people throughout the institution, from our students to the faculty to the administration.

<b>Outcomes Assessment Benefits</b>	
For <b>students</b> , outcomes assessment will	<ul style="list-style-type: none"> <li>• communicate clear expectations about what’s important in a course or program</li> <li>• Inform them that they will be evaluated in a consistent and transparent way</li> <li>• Reassure them that there is common core content across all sections of a course (skills, attitudes, &amp; knowledge)</li> <li>• Allow them to make better decisions about programs based on outcomes results measured against a benchmark</li> </ul>
For <b>faculty</b> , participating in outcomes assessment will	<ul style="list-style-type: none"> <li>• help them determine what’s working and what’s not working in their course or program</li> <li>• help them to more efficiently design content, instruction, and evaluation in their course/program</li> <li>• facilitate valuable interdisciplinary and intercampus discussions</li> <li>• provide powerful evidence to justify needed resources to maintain or improve programs</li> <li>• allow them to tell their story to individuals outside their area (e.g. administrators, politicians, employers, prospective students, transfer institutions)</li> <li>• provide reassurance that all faculty teaching a particular high demand course agree to address certain core content</li> </ul>
For <b>administrators</b> , implementing college-wide outcomes assessment will	<ul style="list-style-type: none"> <li>• demonstrate an institutional commitment to continually improving the academic programs and services offered by the college</li> <li>• provide valuable data to support requests for funds from state and local government and private donors</li> <li>• demonstrate accountability to funding sources</li> <li>• provide valuable data for academic planning and decision-making</li> <li>• enable them to inform elected officials, local businesses, and potential donors about the college’s impact on our students and our community in a very compelling and convincing way</li> <li>• meet the systematic outcomes assessment requirement for SACS accreditation, SCHEV, VCCS, and IPEDS</li> </ul>

## Why aren't grades enough?

When faced with the news that it's your discipline's turn for outcomes assessment, it is tempting to ask why you can't just look at final grades to determine whether a course is successful. Although counting letter grades is easy, it provides neither consistent nor meaningful information about student success in a multi-section course.

In outcomes assessment, the terms "scoring" and "grading" have different meanings. Scoring refers to the process of marking an assessment instrument to get data about how well the course has done at achieving its outcomes. Grading is the process of marking an assessment instrument for the purpose of assigning a student a grade for the course. Scoring needs to be done consistently across all sections; grading can be done differently in each section if instructors desire. In no way, does the outcome assessment scoring process infringe on an instructor's grading.

Unless every instructor teaching a particular course assigns final course grades in exactly the same way (same assignments, same exams, same weights, same grading approach), you cannot be confident that one section's A is the same as another section's A. More significantly, final grades are an aggregate assessment of a student's entire work for the course, often including attendance and class participation. Consequently, looking at a distribution of grades will provide little, if any, useful information about the degree to which students are learning those things that instructors deem most important in the course.

The list below shows additional differences between assessment versus grades:

Assessment	Grades
Formative	Summative
<i>Formative</i> refers to the formation of a concept or item whereas <i>summative</i> refers to an "adding-up" or summary stage. Assessments usually occur in mid-progress when corrections can be made. Grades are usually recorded at the end of a project or class in order to summarize academic quality.	
Diagnostic	Final
Non-Judgmental	Evaluative
Assessment is <i>non-judgmental</i> in the sense that it focuses on learning, which is the outcome of many influences, including teaching style, student motivation, time on task, study intensity, and background knowledge. Therefore, no one element can be reasonably singled out for praise or blame for a particular learning outcome. In contrast, grades carry <i>evaluative</i> weight as to the worthiness of student achievement and are applied, for good or ill, directly to them.	
Private	Administrative
Assessment tend to be used in <i>private</i> and become public only under the assessor's control. Grades, while not truly public, are part of the <i>administrative</i> record available throughout an educational institution.	
Often Anonymous	Identified
Assessment are almost always collected in <i>anonymous</i> fashion and the results are released in the aggregate. Grades are <i>identified</i> with specific students.	
Partial	Integrative
To use a metaphor from the calculus, assessment more resembles a <i>partial</i> derivative whereas grades are more recognizable as in <i>integrative</i> process.	
Specific	Holistic
Assessment tends to look at <i>specific</i> parts of the learning environment. Grades are <i>holistic</i> in the sense that they record academic achievement for a whole project. Final grades, of course, can reduce academic achievement for an entire semester to a single mark.	
Mainly Subtext	Mostly Text
The <i>text</i> of a course is its disciplinary content; grades tend to focus on that. The <i>subtext</i> of a course involves the transferrable baccalaureate skills, such as critical thinking, creative thinking, writing, and analysis. For example, the	

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“text” of a course in anatomy and physiology includes the names of bones and functions or muscles. The “subtext” of such a course might include scientific thinking, problem solving, and memory improvement. Grades tend to focus on text; assessment tends to emphasize subtext.	
Suggestive	Rigorous
Assessment findings tend to be <i>suggestive</i> and have pedagogical significance. That is, assessment findings shift pedagogy for reasons that need not be justified statistically, but can be justified when even one student learns better. In contrast, grades are recorded in a <i>rigorous</i> manner that does have statistical significance.	
Usually Goal-Directed	Usually Content-Driven
As with text and subtext mentioned above, grades tend to reflect student control of disciplinary course <i>content</i> whereas assessment usually aims at the <i>goals</i> for all baccalaureate students, such as synthetic thinking and esthetic appreciation.	

In summary, grades do not provide the following:

- Specific information about students’ performance on discrete tasks
- Meaningful data across sections
- Objective student data which can be used for improvement of student learning or recognition of student achievement

It is critical, however, that students do not approach outcome assessment assignments or exam questions thinking they are of no consequence, as they would likely not take them seriously thus creating a false impression regarding the effectiveness of our courses. Regardless of how instructors grade the instruments, they should communicate to students the value of the outcomes and the instruments used to assess them.

## I. Assessment for External Accountability

Assessment at PDCCC is done first and foremost to improve student learning. However, as a public institution we must respond to public demand for accountability. PDCCC is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (SACS).

Among the Commission's criteria for accreditation is the following [Principles of Accreditation: Foundations for Quality Enhancement]:

- 2.5 – The institution engages in ongoing, integrated, and institution-wide research-based planning and evaluation processes that (1) incorporate a systematic review of institutional mission, goals, and outcomes; (2) result in continuing improvement in institutional quality; and (3) demonstrate the institution is effectively accomplishing its mission. (Institutional Effectiveness)
- 3.3.1 – The institution identifies expected outcomes, assesses the extent to which it achieves these outcomes, and provides evidence of improvement based on analysis of the results in each of the following areas (Institutional Effectiveness):
  - 3.3.1.1 Educational programs, to include student learning outcomes
  - 3.3.1.2 Administrative support services
  - 3.3.1.3 Educational support services

- 3.5.1 – The institution identifies college-level competencies within the general education core and provides evidence that graduates have attained those competencies. (College-level Competencies)

SACS requires that the college evaluate the effectiveness of its instructional programs by a variety of methods and states that the evaluation should involve gathering and analyzing both quantitative and qualitative data that demonstrate student achievement. “Measures to evaluate academic programs and general education may include the following: evaluation of instructional delivery; adequacy of facilities and equipment; standardized tests; analysis of theses, portfolios and recitals; completion rates; results of admissions tests for students applying to graduate or professional schools; job placement rates; results of licensing examinations; evaluations by employers; follow-up studies of alumni; and performance of student transfers at receiving institutions.” [Criteria for Accreditation, p. 20]

State Council of Higher Education for Virginia (SCHEV) requires institutions to determine “what they want students to know and be able to do as a consequence of their major and general education programs” and then use assessment to determine whether the students generally meet those expectations, as well as how students and alumni rate their skills and abilities.

Assessment should yield specific and detailed information, such as the numbers and percentages of students reaching desired levels of competencies, the extent to which general education criteria are being met, or the numbers and percentages of students who are satisfied with their academic and co-curricular experiences.

Assessment should inform institutions of how well they have fostered the success of students who are at risk of failure. It should allow educational leaders to evaluate the quality of off-campus courses and programs. It should allow them to determine how successful they have been in preparing their alumni for further education as transfer or graduate students or for their lives as citizens and workers. It should tell them how well various student support services expect to and do contribute to student learning. [Assessment in Virginia: Guidelines for the Second Decade, SCHEV]

Finally, SCHEV lists the characteristics of good assessment. [Assessment] “should be non-anecdotal, be done systematically and periodically, include all students or an adequate and representative sample, and use both direct and indirect measures of learning and satisfaction.... Good assessment also uses multiple measures and assessors to determine which aspects of programs are successful and which are not. Assessment, to be effective, must be designed by faculty members with appropriate technical support and the support and leadership of top administrators, who use the information it generates to make decisions.” [Assessment in Virginia: Guidelines for the Second Decade, SCHEV]



## II. Assessment of Productivity

Degree, Certificates and Career Studies programs must meet the productivity guidelines of the SCHEV. These guidelines are outlined below. Programs that do not meet the productivity guidelines must either be recommended for discontinuation or must be further evaluated in terms of the costs and resources used to support the program.

- **SCHEV Degree Productivity Requirements and VCCS Viability Standards**

State Council of Higher Education (SCHEV) defines productivity of degree programs and certificates in terms of number of graduates, FTES production, and institutional priority. Each degree program *must* meet the following standards for institutions under 1800 FTES:

<b>SCHEV's Standards for VCCS Degree and Certificate Programs For Institutions under 1800 FTES</b>		
	<b>FTES</b>	<b>Graduates</b>
Transfer (AA&S)	17	12
AAS Agriculture & Natural Resources, Business, Arts & Design, Public Service Technologies	13	8
AAS Engineering, Mechanical, and Industrial Technologies	9	6
AAS Health Technologies	7	5
Certificates & Diplomas	7	5

Note: Degree Production = the minimum annual average number of graduates, over 5 years

FTE Production = the minimum annual average number of full-time equivalent students enrolled, over 5 years

<b>VCCS Program Review Viability Standards Three Year Average</b>	
Transfer	< 20 FTE
Occupational-Technical ( AAS Degree)	< 15 FTE
Certificates	< 12 Headcount

### **III. Assessment of General Education Identified by SACS and VCCS**

SACS requirement for general education is the following [Principles of Accreditation: Foundations for Quality Enhancement, p. 49]:

3.5.1 – The institution identifies college-level competencies within the general education core and provides evidence that graduates have attained those competencies. (College-level Competencies)

The Virginia Community College System (VCCS) defines its general education program as "...that portion of the collegiate experience that addresses the knowledge, skills, attitudes, and values characteristic of educated persons. It is unbounded by disciplines and honors the connections among bodies of knowledge. VCCS degree graduates will demonstrate competency in the following general education areas: communication, critical thinking, cultural and social understanding, information literacy, personal development, quantitative reasoning, and scientific reasoning." [VCCS Policy Manual Section 5.0.2].

The specific general education goals and student learning outcomes that all VCCS degree graduates will be able to demonstrate competency and that each community college needs to assess are the following [VCCS Policy Manual Section 5.0.2.2]:

#### **Communication:**

A competent communicator can interact with others using all forms of communication, resulting in understanding and being understood. Degree graduates will demonstrate the ability to: (a) understand and interpret complex materials; (b) assimilate, organize, develop, and present an idea formally and informally; (c) use standard English; (d) use appropriate verbal and non-verbal responses in interpersonal relations and group discussions; (e) use listening skills; and (f) recognize the role of culture in communication.

#### **Critical Thinking:**

A competent critical thinker evaluates evidence carefully and applies reasoning to decide what to believe and how to act. Degree graduates will demonstrate the ability to: (a) discriminate among degrees of credibility, accuracy, and reliability of inferences drawn from given data; (b) recognize parallels, assumptions, or presuppositions in any given source of information; (c) evaluate the strengths and relevance of arguments on a particular question or issue; (d) weight evidence and decide if generalizations or conclusions based on the given data are warranted; (e) determine whether certain conclusions or consequences are supported by the information provided, and (f) use problem solving skills.

#### **Cultural and Social Understanding:**

A culturally and socially competent person possesses an awareness, understanding, and appreciation of the interconnectedness of the social and cultural dimensions within and across local, regional, state, national, and global communities. Degree graduates will demonstrate the ability to: (a) assess the impact that social institutions have on individuals and culture-past, present, and future; (b) describe their own as well as others' personal ethical systems and values within social institutions; (c) recognize the impact that arts and humanities have upon individuals and cultures; (d) recognize the role of language in social and cultural contexts; and (e) recognize the interdependence of distinctive world-wide social,

economic, geo-political, and cultural systems.

**Information Literacy:**

A person who is competent in information literacy recognizes when information is needed and has the ability to locate, evaluate, and use it effectively (adapted from the American Library Association definition). Degree graduates will demonstrate the ability to: (a) determine the nature and extent of the information needed; (b) assess needed information effectively and efficiently; (c) evaluate information and its sources critically and incorporate selected information into his or her knowledge base; (d) use information effectively, individually or as a member of a group, to accomplish a specific purpose; and (e) understand many of the economic, legal, and social issues surrounding the use of information and access and use information ethically and legally.

**Personal Development:**

An individual engaged in personal development strives for physical well-being and emotional maturity. Degree graduates will demonstrate the ability to: (a) develop and/or refine personal wellness goals; and (b) develop and/or enhance the knowledge, skills, and understanding to make informed academic, social, personal, career, and interpersonal decisions.

**Quantitative Reasoning:**

A person who is competent in quantitative reasoning possesses the skills and knowledge necessary to apply the use of logic, numbers, and mathematics to deal effectively with common problems and issues. A person who is quantitatively literate can use numerical, geometric, and measurement data and concepts, mathematical skills, and principles of mathematical reasoning to draw logical conclusions and to make well-reasoned decisions. Degree graduates will demonstrate the ability to: (a) use logical and mathematical reasoning within the context of various disciplines; (b) interpret and use mathematical formulas; (c) interpret mathematical models such as graphs, tables and schematics and draw inferences from them; (d) use graphical, symbolic, and numerical methods to analyze, organize, and interpret data; (e) estimate and consider answers to mathematical problems in order to determine reasonableness; and (f) represent mathematical information numerically, symbolically, and visually, using graphs and charts.

**Scientific Reasoning:**

A person who is competent in scientific reasoning adheres to a self-correcting system of inquire (the scientific method) and relies on empirical evidence to describe, understand, predict, and control natural phenomena. Degree graduates will demonstrate the ability to: (a) generate an empirically evidenced and logical argument; (b) distinguish a scientific argument from a non-scientific argument; (c) reason by deduction, induction and analogy; (d) distinguish between causal and correlational relationships; and (e) recognize methods of inquiry that lead to scientific knowledge.

**The VCCS Report of the VCCS Task Force on Assessing Core Competencies, clarified and enhanced general education outcomes for students.**

- **Writing**  
In a written discourse the student will demonstrate the ability to state the purpose that addresses the writing task in a thoughtful way; organize content with effective transitions and effective beginning and ending paragraphs; develop logical and concrete ideas with effective use of paragraph structure; use appropriate and precise word choice; demonstrate few mechanical and usage errors with evidence of control of diction.
- **Information Literacy**  
The information literate student will demonstrate the ability to determine the nature and extent of the information needed; access needed information effectively and efficiently; evaluate information and its sources critically and incorporate selected information into his/her knowledge base and value system; use information effectively to accomplish a specific purpose; and, understand many of the economic, legal, and social issues surrounding the use of information and access and use information ethically and legally.
- **Quantitative Reasoning**  
The student will demonstrate the ability to use logical and mathematical reasoning within the context of various disciplines; interpret and use mathematical formulas; interpret mathematical models; use arithmetic, algebraic, geometric, and statistical models to solve problems; estimate and consider answers to mathematical problems in order to determine reasonableness; recognize and communicate the appropriate applications of mathematical and statistical models; and, represent mathematical information numerically, symbolically, and visually, using graphs and charts.
- **Scientific Reasoning**  
The student will be able to generate an empirically evidenced and logical argument; distinguish a scientific argument from a non-scientific argument; reason by deduction, induction and analogy; and, distinguish between causal and correlational relationships.
- **Critical Thinking**  
The student will demonstrate the ability to discriminate among degrees of truth or falsity of inferences drawn from given data; recognize unstated assumptions or presuppositions in given statements or assertions; determine whether certain conclusions necessarily follow from information; weigh evidence and decide if generalizations or conclusions based on given data are warranted; and, distinguish between arguments that are strong and relevant and those that are weak and irrelevant to a particular question at issue.
- **Oral Communication**  
The student will demonstrate skill in idea development and verbal effectiveness by the use of language and the organization of ideas for a

specific audience, setting and occasion and to achieve a purpose; nonverbal effectiveness, assuring that the nonverbal message supports and is consistent with the verbal message and responsiveness, communication skills modified based on verbal and nonverbal feedback.

## **PDCCC General Education Goals & Core Competencies**

As a result of the SACS and VCCS guidelines on general education, the following are the college-wide general education goals:

**Goal 1: Students will develop college-level communication skills. (SACS reading, writing, & oral communication; Writing and Oral Communication Core Competencies)**

**Goal 2: Students will apply critical thinking and problem solving skills. (Critical Thinking Core Competencies)**

**Goal 3: Students will develop an understanding of culture and society. (VCCS General Education)**

**Goal 4: Students will develop information literacy skills to engage in life-long learning. (Information Literacy Core Competency and SACS computer skills)**

**Goal 5: Students will promote personal development by engaging in physical well-being and emotional maturity. (VCCS General Education)**

**Goal 6: Students will apply quantitative reasoning skills. (Quantitative Reasoning Core Competency/SACS math skills)**

**Goal 7: Students will develop scientific reasoning skills. (Scientific Reasoning Core Competencies)**

Each program awarding a degree or certificate is required to devise program-specific general education objectives for each college-wide goal. This approach to general education recognizes that student attainment of the general education goals of the college is achieved within the context of academic degree programs. The general education goals and program goals may overlap, and the assessment of general education is most effective when embedded in program courses.

By establishing college-wide goals and requiring each program to devise its own objectives, ownership and accountability for general education are placed in the hands of program faculty. The college-wide goal statements are intentionally stated broadly to give programs flexibility in meeting the general education goals through objectives that are relevant to their program. As part of the program review, program heads devise program-specific general education objectives for the students in the program for each general education goal using both direct and indirect multiple measures.

Faculties teaching general education discipline courses are required to explicitly link the objectives of their courses to the general education goals. For example, if a social science course is to be used to fulfill general education requirements, then it should be clear which general education goals are addressed in the course, the ways the students might achieve those goals, and how student attainment of the goals will be assessed. These courses will then form the core of general education courses for the college.

## ELEMENTS OF ASSESSMENT AND PROGRAM REVIEW REPORT

### **I. Assessment of Student Outcomes**

Assessment is the process of gathering evidence of student learning, reviewing the evidence to determine if students are learning what they are expected to learn, and using this evidence to alter the direction of your course.

For example, you might “map” certain questions on a test to specific learning objectives. After administering a test, you would examine the students’ performance on the test questions to determine how well the students’ are grasping the intended learning outcomes. If you determine the performance is satisfactory, then you have evidence that the learning objective is being met. If you determine the students’ performance is below your expectations, you should use the feedback to reevaluate the way the material is presented or review the concepts with students. It is important to remember that the purpose of the assessment is to create a better teaching and learning experience.

Students who know what is expected of them in terms of their learning have a framework for learning and are more successful. Faculty who have a clear idea of what they want their students to learn are able to align their instructional activities to these outcomes. In these two ways, clearly articulated outcomes are essential to student learning. Outcomes assessment allows us to systematically examine the alignment between student learning, instructional or institutional expectations and instructional activities. To this end, we begin planning for outcomes assessment with student learning outcomes. A student learning outcome (SLO) is defined as a specific, measurable competency (knowledge, skills, values, or attitudes) that your students should be able to demonstrate as a result of participation in a learning activity. SLOs reflect a shift from a focus from “What am I teaching” to “What are my students learning?” SLOs can be expressed and measured at the course, program or institutional level.

#### **Course Assessments**

##### **Where do we start?**

Every course should have a set of college-wide, common, core expectations for student learning. These expectations are the most important things a student who passes the course should take away from any section of the course. While individual instructors may add to this course, there should be a shared understanding of the core skills and knowledge upon which the course is based. It is these expectations which should be reflected on each course syllabus and which should be used to determine student learning outcomes for the outcome assessment process. Student learning outcomes are statements that specify what you want your students to know and be able to do at the end of the course. For example, student learning outcomes can refer to knowledge, practical skills, critical thinking skills, etc. that students are expected to develop or learn.

##### **What makes a good learning outcome?**

A well-defined student learning outcome specifies actions by students that are observable, measurable, and must be done by the students themselves. The crucial factor in determining if

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your learning outcome is well-defined is whether or not the action taken by the students can be measured. Do not focus on small details, but rather on general knowledge and/or skills you expect your students to acquire through your course. Do not merely describe activities or lessons from the course, but rather articulate the learning that will *result* from the course. Make sure your statement is centered not on what you are going to teach them, but rather on what the student will do. For example, “upon completion of this course students will be able to identify all the critical elections in 20<sup>th</sup> Century America” as opposed to “one objective of this course is to teach about the critical elections in 20<sup>th</sup> Century America.”

Generally speaking, good learning outcomes are:

- Learner centered
- Key to the course’s mission
- Meaningful for faculty and students
- Representative of a range of thinking skills
- Measurable

First, and most importantly, good learning outcomes focus on **what students can do** instead of the effort we put into teaching them. Second, college-wide outcomes must be **essential to the course’s mission**, something that everyone teaching the course agrees is important. Avoid outcomes that are idiosyncratic or tied to a particular instructor’s approach to a course. Third, design outcomes that are **meaningful for faculty and students**. If you cannot explain why a certain outcome is important, it probably isn’t very meaningful. Finally, outcomes often reflect a **range of thinking skills**, from low level identification to higher level application of knowledge or skills.

Good outcome **are measurable** in some way; they communicate what student learning will be evaluated in the course. Often courses will have two levels of outcomes; some broader based outcomes which reflect higher order thinking skills and broad topics, and some more narrow, lower level thinking skills outcomes which are essential to reaching the broader outcomes. If the course doesn’t have expectations for student learning formulated as student learning outcomes, the development of college-wide common core student learning outcomes maybe one of the first outcomes of this process. The outcomes should become a standard part of the syllabus.

When defining SLOs to assess, it is tempting to take the easy route and think only in terms of learning outcomes that represent lower order skills because they will be simpler to evaluate. Instead concentrate on the skills and knowledge which are essential for a student to be considered competent at the end of the semester. While some lower order types of leaning outcomes may be essential to reaching higher level outcomes, make sure that you define a range of outcomes which reflect higher order, complex application tasks in addition to any essential supporting learning outcomes which may reflect lower order thinking skills.

### **Lower order vs. higher order thinking skills**

While basic recall of facts is important to any course, your assessment results will be more meaningful if you have chosen a more complex skill. Moreover, it will likely reflect what is truly

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important in your course. Often facts are important because we want students to be able to do something with that information.

SLOs which reflect higher order thinking skills, use action verbs that are observable and measurable, as well as ones that reflect higher order skills. Examples of such verbs are solve, design, write, compare, apply, decide, draw, persuade, investigate, and evaluate.

Refer to the following possible outcomes for an information technology course:

- Students will be able to correctly summarize the key differences between open and closed source software development models.
- Students will be able to evaluate the strengths and weaknesses of open and close source software development models.

While the first outcome is certainly easier to achieve, the second one better represents what students would have to do with the information in the real world. You will get more useful information about student learning with the second SLO.

### **How do you write SLOs for a course or program?**

A student learning outcome statement needs to specify who is to perform (student), what action they are to take, and some result that must come from their action. A student learning outcomes (SLOs) for a course/program should:

- Be written in terms of what the student/graduate will be able to do at the end of the course/program
- Be limited to 2-5 outcomes
- Keep them short and simple (KISS)
- Make them specific, measurable, attainable, realistic, and timely (S.M.A.R.T)
- Establish a target performance level for success (i.e. 70% will ...)
- Keep the assessment process manageable and meaningful (M&M)
- Use Bloom's Taxonomy and active verbs (create, analyze, demonstrate, etc.)
- Be written in the positive instead of the negative
- Reflect measurable standards (benchmarks) or reflect the basic knowledge and skills that the student will be held accountable for
- Reflect a combination of higher order thinking skills and supporting or enabling skills

### **What are some basic examples of well-defined student learning outcomes?**

*Unclear student learning outcome statement:*

- The students will understand democracies.
- The students will appreciate art from other cultures.
- The students will learn about the law of relativity.



*The above statements are not well-defined learning outcomes since they are not measurable. However, these statements can be modified to become well-defined learning outcomes as follows:*

- The students will be able to describe the major theories of democracy.
- The students will be able to identify the characteristics of art from other cultures.
- The students will be able to explain the major tenets of the law of relativity.

Models to assist in creating and writing student outcome assessments include the S.M.A.R.T Model and the A-B-C-D Model (see below)

S.M.A.R.T Objectives to Generate Outcomes	
<b>Specific</b>	<ul style="list-style-type: none"> <li>• A specific objective has a much greater chance of being accomplished than a general goal (Who, What, Where, When, Which and Why)</li> <li>• General Goal – This year I am going to get into shape.</li> <li>• Specific Objective – This year I am going to join a health club and workout 3 days a week.</li> </ul>
<b>Measurable</b>	<ul style="list-style-type: none"> <li>• Establish concrete criteria for measuring progress toward the attainment of each objective you set</li> <li>• Stay on track, reach target dates and experience achievement</li> <li>• How much? How many? How will I know when it is accomplished?</li> </ul>
<b>Attainable</b>	<ul style="list-style-type: none"> <li>• When you identify objectives that are most important to you, you begin to figure out ways you can make them come true.</li> <li>• You develop attitudes, abilities, skills, and financial capacity to reach them.</li> <li>• You can attain most any goal you set when you plan your steps WISELY and establish a time frame that allows you to carry out those steps.</li> </ul>
<b>Realistic</b>	<ul style="list-style-type: none"> <li>• To be realistic, an objective must represent something towards which you are both WILLING and ABLE to work.</li> <li>• Your goal is probably realistic if you truly BELIEVE that it can be accomplished.</li> </ul>
<b>Timely</b>	<ul style="list-style-type: none"> <li>• A objective should be grounded within a timeframe. With no timeframe tied to it there's no sense of urgency.</li> <li>• When you set a timeframe, then you have set your unconscious mind into motion to begin working on the goal.</li> </ul>

Writing Effective and Measurable Objectives: The A-B-C-D Model		
Element	Description	Example
<b>A = Audience</b>	Who is performing the action? Learning objectives are always stated in terms of student outcomes.	Following completion of the Science program, <b>the student</b> should be able to plot a quadratic equation using a graphing calculator in two minutes or less.
<b>B = Behavior</b>	What will the student be able to do? Use Bloom's Taxonomy and action verb that describe an accomplishment that is measurable.	Following completion of the Science program, the student should be able to <b>plot a quadratic equation</b> using a graphing calculator in two minutes or less.
<b>C = Condition</b>	Give the conditions under which the performance will occur. Be specific.	<b>Following completion of the Science program</b> , the student should be able to plot a quadratic equation <b>using a graphing calculator</b> in two minutes or less.
<b>D = Degree</b>	Describe the minimum criteria for acceptable student performance.	Following completion of the Science program, the student should be able to plot a quadratic equation using a graphing calculator <b>in two minutes or less</b> .

### How do we choose which SLOs to assess?

To select SLOs to assess for this process, consider the following questions:

- What are the 3 or 4 most crucial outcomes for the course?
- Are there topic areas or where students struggle on a regular basis?
- Do you have questions about a particular area of student achievement?
- Are there outcomes which reflect skills or knowledge students will need in future courses or careers?
- Are there outcomes which reflect Gen Ed competencies?

Identifying outcomes which reflect any of these characteristics would be a place to start. Ultimately the outcomes you select:

- Should reflect higher order thinking skills (**application of knowledge or skills**)
- Be agreed upon as essential and core to the course (addressed in **every section** of the course)
- **Be meaningful** to the discipline

### How do we include a Gen Ed (Core Competency) in our SLOs?

For courses which have a primary Gen Ed (Core Competency) component, one or two of your outcomes should reflect this competency. The outcome should also be more specific as to how the students are expected to use that skill in your course.

Five key things to remember about college-wide common core student learning outcomes for a course include the following:

- Select outcomes to assess because they are meaningful, not because they are easy to measure.
- Make sure your outcomes are expressed in terms of how students are impacted by your

course.

- Make sure they your common core outcomes reflect a faculty consensus in your discipline and not just the views of a few individuals.
- Where possible, have your outcomes reflect higher order thinking skills.
- Make sure that all faculty and students involved with the course are familiar with the outcomes.

The template to use in doing course student learning outcomes assessment with an example is the following:

<b>Course Outcomes Assessment Plan Template</b> <b>&lt;course being assessed for term your are teaching&gt;</b>			
Goal/Objective (with Target Performance level for success (i.e. 70% will ...))	Evaluation method (To evaluate expected outcomes (Direct and/or indirect))	Findings/Results	Action to be taken (Closing the loop)
Course Objective 1			
Course Objective 2			

<b>Sample Course Assessment Plan for SDV 108 College Survival Skills</b>			
Goal/Objective Being Assessed (SLO)	Evaluation method (Expected Outcomes)	Findings	Action to be Taken
70% of students will demonstrate effective time management skills	Keep schedule in Daily Planner	65% of students show satisfactory or better planner usage	Add additional exercise using time management techniques and include important dates in planner
70% of students will demonstrate-appropriate comprehension of course material	Weekly portfolio assessment of reading, writing & other exercises	85.5% of students exhibit satisfactory or better apprehension of course material.	Criterion has been met. Continue to monitor assignments and exercises.
70% of students will utilize effective study skills to successfully complete course work.	Class exercises & research essay/presentation completion in portfolio	60% of students exhibit satisfactory or better exercise completion	Continue to monitor exercises. Add a group exercise on study skills techniques
70% of students will exhibit effective note-taking skills	Class Note-Taking exercises and evidence of actual class notes in portfolio	86.5% of student exhibit satisfactory or better note-taking skills	Criterion has been met. Continue to monitor note
70% of students will exhibit and demonstrate personal behavior that prepare them for success	Class attendance & participation, exhibition of personal responsibility using rubric	84% of students regularly attended class, participated in class activities, turn in assignment & bring required materials to class	Criterion has been met. Continue to monitor attendance and participation
70% of students will demonstrate ability to use a computer and information literacy skills	Technology assignment completion, library resources, and email sent to instructor	78% of students accessed library databases, completed the library orientation worksheet assignment, and sent email to instructor using blackboard	Criterion has been met. Continue to monitor Internet technology assignments and library research activities

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## Program Assessments

Assessing student outcomes for programs (See Section II of the Program Review and Student Outcomes Assessment Template) is the most effective way to determine whether PDCCC's programs are accomplishing the goals and objectives set forth in each program's review. A careful analysis of the results of the students' assessment lets faculty and administration know where improvements need to be made.

Certain academic areas, such as general education, transfer, remediation, and selected special programs are assessed annually. The responsibility for assessment in these areas is shared by the Director of Assessment, faculty and administrators in those targeted areas.

Some goals and objectives in programs should be assessed internally on an annual basis and all goals/objectives must be evaluated at least once within the five-year cycle. The responsibility for assessment rests with the program faculty with assistance from the Director of Assessment.

For example, during the five-year cycle, the program faculty might define all program and general education goals with evaluation methods and assess program goal 1 (See sample matrix) during the first year. The program faculty might do surveys and assess 2-3 program goals and one general education goal during the second year of the cycle. On the third year, the program faculty might assess program goal 1 again along with 3-4 general education goals. The fourth year would focus on assessing any goals not yet assessed. The fifth year would focus on completing the program review template.

The Program Review and Student Outcomes Assessment template has been placed on the network drive under Common (Pc02)/Assessment/Faculty\_Draft\_Documents/Program\_Review/<specific program folder>. During the program faculty's five-year program review cycle, all annual entries and edits are to be made in the appropriate program folder. The Office of Institutional Research (IR) will be entering annually numerical data to each Program Review Assessment template as it becomes available. Program faculty are to set-up their program and general education goals matrix, make annual entries, and complete the student outcomes assessment narrative which is all located in Section II of the Program Review and Student Outcomes Assessment template.

### **In setting up the five-year student outcome assessment matrix for any program or discipline, there are several steps to follow:**

1. State the program and general education goals which **support the mission** of the college.
2. Determine the **multiple evaluation methods** that will most effectively assess whether those goals are being met.
3. **Analyze** the data collected from the assessment strategies and describe the findings including strengths and weaknesses.
4. Prepare a narrative which describes the assessment process including how the data was analyzed and the process in which assessment strategies were implemented.
5. Determine whether the goals of the program and general education goals are being met, and **state the actions taken or to be taken** to address any concerns or

deficiencies. **Close the loop.**

## A. Program Goals

When doing annual student outcomes assessments, programs are asked to use multiple assessment measures, of which at least one must be a direct measure. Faculty from each major is asked to select any assessment methods that they believe will be effective in measuring whether students achieved the goals of the program. The assessment of a major will give faculty vital information concerning the program to be incorporated into the program review. Advisory committees for OT programs are involved in reviewing curriculum. Some of the assessment methods used are tests, competency checklists, rubrics, portfolio review, job placement rates, employer surveys, oral examinations, written examinations, external certification examinations, skills examinations, student surveys and panel reviews. The Director of Assessment will serve as a resource to faculty for implementation of the assessment activities for that program. Upon request, assessment results are sent to the VCCS and/or to SCHEV.

When doing a program review, the program review is based upon your five-year student outcomes assessment results. This would include completing the student outcomes assessment matrix showing program and general education goals, multiple assessment methods (external, as well as internal), findings, and actions taken or to be taken. The program review process is concluded with the completion of the Program Review Template which requires various quantitative figures and answering questions pertaining to how the other areas of the College are meeting the needs of the program being evaluated.

**Below is a SAMPLE of the matrix to be used for all assessments.**

Goal/Objective being assessed	Evaluation Methods	Findings	Actions taken or to be taken
<b>Program Goal 1</b> Computer Analysis: 75% of students will be able to diagnose, troubleshoot and repair computer system problems	Faculty observation during class and completion of task list test.	75% of the students received a satisfactory grade.	A handout on the requirements for a satisfactory grade will be provided to students.
<b>Program Goal 2</b> 75% of students will demonstrate the ability to work effectively on a team.	Faculty observation during class-time devoted to group project work in (list course). Student written self-evaluation in (list course).	Faculty observed that 75% of the students demonstrated the ability to work effectively on a team. 90% of the self-evaluations indicated good understanding of effective teamwork	Have students critique a video showing a team at work and have them indicate which principles were well-employed and which were not.
<b>Program Goal 3</b> 80% of students will demonstrate the ability to work effectively on a team	Project assignments in ALL IST courses are completed in a timely manner.  80% of students will receive a favorable review of portfolios. The portfolios will be evaluated by program heads and the advisory committee. Where possible the portfolios will be available online.	All assignments have been completed in a timely manner per IST faculty. Portfolios were review at the Spring IST meeting IST 226/129 – web sites IST179/180/216-review written procedures for troubleshooting, assembly, safety IST 202/CS200-engineering journals	No further action required at this time. Faculty will continue to monitor and assure that assignments are completed in a timely manner.  The Advisory Committee approved that all portfolios met IST standards.

When assessing your program goals, one should also incorporate in the program assessment any additional factors and/or disciplines affecting the program. These factors to assess could include:

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off-campus/distance learning courses, transfer of students from your program to other institutions, dual credit, vocational articulation agreements, the effectiveness of student development services or developmental remediation. The Director of Assessment will serve as a resource.

The following paragraphs give brief descriptions of assessment in varied discipline areas and responsibility.

- **Developmental Studies (Remediation)** –

The goal of the developmental studies program is to prepare students in the areas of reading, writing, and/or math for credit classes in one of the college's academic programs. The assessment of the developmental studies program (remediation) includes the following:

1. Determine the rate of students successfully completing developmental classes;
2. Track the success of developmental ENG 01 students and MTH students into credit English and math courses (success being defined as earning a "C" or better);
3. Track ENG 05 students through their first year of credit work and determine GPA and credit earned as compared with non-developmental students;
4. Determine the graduation rate of former developmental students compared to non-developmental students, and,
5. Determine the efficiency of placement testing and procedures. The Developmental Studies Committee is responsible for completion the remediation assessment. The Director of Assessment will serve as a resource.

- **Transfer**

The goal of the transfer program is to prepare students to transfer to a senior institution. The assessment of transfer students includes the comparison of student performance at PDCCC and the senior institution using the data provided by the senior institutions. Analysis that compares students' performance by department will be completed if sufficient data exists. Additional information used in this section is graduate surveys. The assessment of transfer is completed annually. The Research Office is responsible for completing the research and report.

- **Dual Credit**

The goal of dual credit courses is to provide prepared high school students with the opportunity of taking college courses while still in high school. Dual credit courses fall into two categories: occupational/technical and college transfer. Occupational/technical students take these courses on-campus with full-time instructors and are assessed in the same way as regular college students. Transfer courses are normally taught in the high schools, using adjunct faculty, usually high school instructors meeting SACS criteria. Those courses are assessed by using quality assurance checks to ensure that each course uses the same text, has the same requirements, has equivalent exams, and has the same grading procedures. Classes are visited by college faculty and/or administrators, and instructors are evaluated. Additionally, dual credit students' future performance is tracked to the extent possible through data from PDCCC and the senior institutions. The Vice President of Instruction assigns the monitoring of dual credit classes to the appropriate administrator. The Dual Credit Coordinator is responsible for tracking students' future performance. If the program

faculty has a large dual credit component, some assessment as to how the dual credit students performed compared to non-dual credit students should be done during the five-year cycle.

- **Off-campus/Distance Learning**

The goal of off-campus/distance learning is to provide access for instruction to students who may be restricted by physical location. A comparison of performance by campus is done by instructors, as well as a survey. Assessment measures are located in the Quality Assurance Plan for Distance Learning in the Assessment folder of the Common file. Assessment reporting is the responsibility of the Distance Education Coordinator.

Assessment activities for PDCCC Smithfield follow the assessment activities for the college. Where appropriate, data is separated and compared by the Director of PDCCC Smithfield.

If a program has a distance learning component, the program faculty should assess its effects sometime during the five-year cycle. For example, distance learning students' performance should be compared to on-campus classes. One might compare grades in similar courses or compare similar test questions on content.

## B. General Education Goals

The following matrix should be followed in assessing students General Education skills.

General Ed Goal	Evaluation Method*	Findings	Action taken or to be taken
75% of students will develop college-level communication skills			
75% of students will demonstrate information literacy skills to engage in life-long learning			
75% of students will apply critical thinking and problem solving skills.			
70% of student will demonstrate an understanding of interpersonal and human relations			
75% of students will apply quantitative skills and computer proficiency			
75% of students will develop an understanding of culture and society.			
75% of students will apply the knowledge of science and technology			
90% of students will develop the knowledge of wellness necessary for a healthy lifestyle			

\*note any embedded courses

### C. Student Outcome Assessment Narrative

As the end of the five-year cycle approaches, the program/discipline faculty will prepare a 1-2 page narrative that describes the student outcomes assessment process. This narrative should include how the data was analyzed and the process in which assessment strategies were implemented. Once the student outcomes assessment section of the program review is completed, the Director of Assessment should be notified. This will allow time for the student outcomes assessment section of the program review to be reviewed before the final Program Review and Student Outcomes Assessment Report is due.

### D. Action Plans

The format for the future plan of action will be a matrix. It is based upon the program/discipline faculty's review of the total program/discipline strengths and weaknesses and its interaction with other areas of the College.

RECOMMENDATION	RATIONALE	ACTION TO BE TAKEN	RESPONSIBILITY	DATE BY
	The evidence/documentation from the report that supports the recommendation or suggestion	This should be specific in nature. Just what, exactly is to be done?	Name a single person as the responsible party.	Be realistic here. The wheels of academe grind slowly.

### E. Advisory Committee

For OT programs, include a copy of the Program Advisory Committee minutes in Appendix A of the Program Review and Student Outcomes Assessment template. This is supporting documentation of the assessment process. Be sure to also include its recommendations and actions in the program/general education assessment matrix under recommendations and actions.

## II. Program Review and Student Outcomes Assessment Template

The program review template is a series of questions addressing the program's productivity, demographic information, goals and objectives (How does the program fit the mission of the college), student outcomes, the curriculum, instruction, and marketing. Completing the template will assist the program faculty in evaluating the program and seeing how it interrelates with other areas of the college. This template will become the final report. It includes the following areas:

#### A. Evidence of Reviews

This part of the Program Review and Student Outcomes Assessment template shows a quick view of the status in the program review process. The evidence of reviews is located in the front of the template and in Appendix A: Advisory Committee Minutes. It will include the date of the last program review, and the dates that the program was reviewed by the program faculty, the advisory committee, the Office of Assessment and Institutional Research, and the Educational Committee. The Appendix A will have all of the Advisory Committee minutes of the five-year assessment process.

#### B. Executive Summary

This part of the Program Review and Student Outcomes Assessment template will focus on quantitative information which will be provided mainly by the Office of Institutional Research (IR), a summary of the program's strengths and weaknesses provided by the program faculty,



and budget needs to improve student learning and quality of the program.

The demographic information provided by IR will include such things as the following:

- Number of students enrolled fall semester (include five-year average)
- Number of FTES generated by the program
- Program demographics on sex, race, and age
- Number of graduates in last five graduating classes
- Number of graduates employed in their field (Part-time & Full-time)
- Graduation Rate (VCCS)
- Salaries of graduates (include typical starting salary as reported by employers, and salary range reported by graduates)
- Retention rate
- Transfer Information
- Job Market Information. Do job market data from the service region indicate a continuing need for this program? (*See VEC Office and Occupational Outlook Handbook*).
- Licensing/Certification Examination Results

### **C. Section I: Overview of Program Goals and Objectives**

This section of the program review template is to give a brief history of the program/discipline and to evaluate how its goals and objectives are derived from and support the college mission and purpose of the program/discipline. It also examines various surveys as to how students and graduates see the program/discipline meeting their goals and the goals of the program/discipline.

### **D. Section II: Student Outcomes Assessment**

This section of the program review template is where the 1-2 page student outcomes assessment narrative, the program and general education goals/objectives matrix and plan of action are located. This matrix will show all of the assessments performed during the five-year cycle. The focus of this section is to show how students are learning the knowledge, skills, and habits needed to be successful in the program.

### **E. Section III: Curriculum**

This section of the program review template is to evaluate how the program/discipline is coherent, current, and consistent. It examines such things as the syllabi, capstone courses, embedded courses, service learning, pre-requisites, articulation agreements, advisory committee, faculty advising, and the academic ladder.

### **F. Section IV: Instruction**

This section of the program review template is to examine how instruction is effective in enabling student learning. It looks at such things as distance learning, instructional modalities, integrating technology, quality of instruction, and professional development.

### **G. Section V: Resources**

This section of the program review template is to evaluate how the College's resources are adequate for the production of student learning and how the academic support services are adequate to facilitate student learning. It looks at how the different areas of the College promote

student success in a specific program/discipline. It examines such areas as the library, LRC, physical resources, equipment, clerical support, counseling, tutoring, placement testing, student activities, and financial aid.

#### **H. Section VI: Marketing**

This section of the program review template examines recruitment and marketing efforts. It identifies target groups, recruit efforts, promotional materials, and brochures.

#### **I. Section VII: Program Review Rating Form**

This section of the program review template rates the effectiveness of all areas having an impact on any program/discipline and student success. It also helps to identify areas that need improvement for VCCS and/or SACS guidelines.

#### **J. Appendix**

This is where all advisory and/or committee minutes during the five-year cycle are located, promotional materials/brochures, and if required, the SCHEV Productivity Report. The Educational Committee's comments will also be included in the appendix.

After the Program Review and Student Outcomes Assessment template is completed and reviewed by the program/discipline faculty and any Advisory Committee. It is sent to the Director of Assessment for review. After being reviewed, the report will then be forward by the Director of Assessment to the Education Programs Committee. The Educational Program Committee will invite the program/discipline faculty to its September or October meeting to present the program/discipline review and answer any questions. After the meeting, the Educational Program Committee chair will forward the program/discipline review with committee comments to the Vice President of Instruction who will share it with the Vice President's Council members.

## Appendix A: STUDENT OUTCOMES ASSESSMENT CHECKLIST

The following checklist should be used by those doing program assessment. Dates listed are the **last** acceptable date for the completion of the respective activity. (Most should be completed well in advance of the date given.) The Director of Assessment and Vice President of Instruction may ask for update reports on those activities that should be completed.

1. Define the goals of the program. This should be done as early as possible, but no later than August 31 of the academic year.
2. Planning assessment activities
  - a. Meet with the Director of Assessment no later than September 15 of the academic year to discuss preliminary plans.
  - b. Complete assessment plan draft by October 1.
  - c. Present plan to your dean and Director of Assessment by October 1.
3. Complete assessment activities by March 15.
4. Analyze the results and report to your dean and the Director of Assessment by April 1.
5. Write and submit the summary Report by May 1 to your dean and the Director of Assessment. This must include the following:
  - a. A narrative describing the assessment activities, their analysis and the implementation of strategies.
  - b. The completed assessment matrix and any supporting documentation.
6. The lead faculty for a program review submits an electronic Program Review Report to the Educational Programs Committee in September/October for the Committee to review and provide recommendations and forward to the Vice President of Instruction.

## Appendix B: Program Review & Student Outcomes Assessment Schedule

### Program Review and Assessment Schedule at PDCCC

\*\*\*Note: "A"=Assessment; "PR=Program Review

Arts and Science Transfer Degrees	2008- 2009	2009- 2010	2010- 2011	2011- 2012	2012- 2013
Science	A	A	PR	A	A
General Studies	A	A	PR	A	A
Business Administration	A	A	PR	A	A
Education	A	A	PR	A	A
<b>Associate in Arts and Science (O/T) Degrees</b>					
Administration of Justice_Corrections	A	A	PR	A	A
Administration of Justice_Police Science	A	A	PR	A	A
Administrative Support Technology_Executive	A	PR	A	A	A
Administrative Support Technology_Word Information Processing	A	PR	A	A	A
Early Childhood Development	A	A	A	PR	A
Industrial Technology_General	A	A	A	PR	A
Industrial Technology_Electronic Electrical	A	A	A	PR	A
Industrial Technology_Electronic Controls	A	A	A	PR	A
Management General	A	A	PR	A	A
Management_Computer Support Specialist	PR	A	A	A	A
Management_Marketing	A	A	PR	A	A
Management_Hardware & Software Support	PR	A	A	A	A
Nursing	n/a	A	A	A	PR
<b>Certificate</b>					
Clerical Studies	A	PR	A	A	A
Early Childhood Development	A	A	A	PR	A
Electricity	A	A	A	PR	A
<b>Career Studies Certificates will be included in related program reviews except:</b>					
Nurses Aid	A	A	A	PR	A
<b>Disciplines</b>					
DEVELOPMENTAL	A	A	PR	A	A
DUAL CREDIT including quality assurance plan	A	A	A	PR	A
DISTANCE LEARNING including quality assurance plan	A	A	PR	A	A
ACADEMIC DISCIPLINES (ENG, MATH, HUMANITIES, SOCIAL SCIENCES, SCIENCES) on an as needed basis					

## Appendix C: O/T Advisory Committee Checklist

### O/T Advisory Committee Checklist

**1. Program goals and their alignment with industry goals and standards**

Review the program's goals and assure that they are relevant to the standards of industry.

**2. Student outcomes objectives, including General Education objectives**

Describe what students should achieve as a result of the program in specific measurable terms. (Example – “80% of students will achieve a C or better on written exam” “80% of the students will meet or exceed the regional average Work Keys” or the success rate of students on Capstone, Exit exams, portfolio or exit interview.)

**3. Program alignment with standards of accrediting bodies, the state of Virginia, and PDCCC**

Confirm that the program is in alignment with SCHEV, VCCS and PDCCC standards of curriculum design, including general education core requirements and O/T objectives.

**4. State and local employer needs**

Describe the extent to which the program curriculum meets state and local employer needs.

What sources of information do you use?

Has the program been modified in response to this input?

**5. Support of General Education/Core Competencies outcomes within program-specific courses**

Consult the General Education Matrix of the VCCS Assessment Report to determine the general education objectives/elements that are supported in program-specific courses. (Example: Writing reports in a technology laboratory course helps support writing competence.)

**6. Student progress toward program completion**

Review the length of time students take to complete the program and address methods of assisting students towards a more timely completion of the program.

Assess graduate competence.

**7. Curricular Development**

Review the program curriculum and determine the need for changes due to technology innovations or industry standards.

## [Appendix D - Classroom Assessment Techniques – A Short Summary](#)<sup>1</sup>

### **Assessing Students' Prior Knowledge, Recall, and Understanding:**

Background Knowledge Probe – to assess students' knowledge or misconceptions of topics in an upcoming unit of study, the faculty member prepares 2-3 open-ended questions and a few short-answer questions about the topics or 10 multiple-choice questions about the topics; before introducing the unit of study, students fill in their answers to the questions; the faculty member uses these responses to determine areas of emphasis on topics during the unit and misconceptions that should be addressed.

Minute Paper – at the beginning or end of a class session, the faculty member asks students to take a few minutes (10 or less) to respond to one or two of the following questions: “What was the most important thing you learned during this class?” and “What important question remains unanswered?” The faculty member uses these responses to determine which questions in students' minds need to be addressed.

### **Assessing Students' Skills in Analysis and Critical Thinking:**

Categorizing Grid – to assess students' level of basic analytical thinking, the faculty member selects 2-3 related categories that are useful for organizing information being presented in class. Then a list of items that belong in each category is created, making sure that each item belongs to only one category, and that the items should be easily recognizable to students from homework and class discussions. A grid is created (on paper, chalkboard, or transparency) with the categories at the top and the items on the side. Students must decide which items belong in which categories, and be prepared to state their reasoning behind their choices.

Pro and Con Grid – select a decision, judgment, dilemma, or issue that has teaching/learning implications in your class; write a statement or question that will elicit thoughtful pros and cons, indicating if possible the point of view that you wish students to take (for example, in a parent-child conflict, should they take the parent's point of view, or the child's?); have students come up with a list of pros and cons (limit the number that you expect them to list); use these to analyze whether students are considering all of the points that you expected them to think about.

### **Assessing Students' Skills in Synthesis and Creative Thinking:**

One-Sentence Summary – the faculty member chooses a topic or work that students have recently studied and should be able to summarize; the faculty member answers the questions “Who Did/Does What to Whom, When, Where, How, and Why?” in relation to the topic – note the amount of time taken; the faculty member turns the answer into a sentence that follows the pattern of the question above; allowing students twice as long, the faculty member gives the exercise to the students, checking the results for quality of response to each part.

Annotated Portfolios – the faculty member chooses a central topic, question or problem dealt with in the course; students are invited to respond with two or three samples of their work on this topic; the students are asked to explain how the work in their portfolio relates to the topic; all of the work and explanations are turned in via a folder, binder, etc., for assessment.

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<sup>1</sup> The Classroom Assessment Techniques (CATs) summarized below are taken from Classroom Assessment Techniques: A Handbook for College Teachers, 2<sup>nd</sup> Edition, by K. Patricia Cross and Thomas A. Angelo.

**Assessing Students' Skills in Problem Solving:**

Problem-Recognition Tasks – the faculty member selects examples of several different but related problem types that students have trouble distinguishing (each example should fall into only one problem type); make up a short Problem Recognition Task form, with problem types and the examples given; students match the examples to the problem type, explaining the reasoning behind their choices.

Documented Problem Solutions – the faculty member selects 1-3 representative problems from among those which students have studied over a period of time (if more than one is chosen, they should vary in difficulty and be progressively more challenging to the students); solve the problems chosen and document your solutions in writing – when you have problems you can solve in this way in 30 minutes, write them up for the students; give the problems to the students, usually as homework, and give them a maximum amount of time that they should spend on the problems (usually about twice as long as it took the faculty member).

**Assessing Students' Skills in Application and Performance:**

Applications Cards – the faculty member identifies an important principle, theory, or procedure that is applicable to areas outside the classroom and how many applications to ask students to generate (usually no more than 3, giving students 3-5 minutes total for the exercise); the faculty member writes a prompt before class and gives it out in class, along with small index cards or slips of paper; students are requested to come up with fresh “new” applications of the principle, theory, or procedure, not just repeat those they may have read about in the text or heard about in class; faculty member collects and analyzes the cards.

Student-Generated Test Questions – the faculty member focuses on an exam that is 3 weeks to a month away, and writes specifications for the types of questions he/she wants to put on the exam; have students write test questions according to their specifications and supply answers to those questions (may want to have students work in groups for this exercise).

With all of these techniques, Cross and Angelo strongly encourage faculty to explain clearly to students that these exercises are not part of their grade in the class, but are designed to assist students in learning and succeeding in the course. Also, they stress the necessity of giving students feedback on the results of these activities – such feedback is crucial to having students get the most out of these activities and fostering a climate of trust between the faculty member and the students.

## **Appendix E: Assessment of Student Learning Outcomes**

Part of the outcome assessment plan is choosing an assessment method and writing an assessment instrument. The assessment method is the general type of tool you will use to assess the SLO. The instrument is the actual assignment, quiz, exam, or project you will use to complete the assessment. First, you should determine what method you want to use, and then, you will develop the actual tool.

### **How do we choose an assessment method and develop an assessment instrument?**

Common assessment methods include test questions (multiple choice, short answer, essay), formal writing assignments (essays, research papers, reaction/review papers), performances, and portfolios. You will need to consider a variety of factors as you choose your method, including alignment with the outcome, ability to get faculty consensus, and ease of scoring. It is difficult to separate the method from the instrument; however, it is useful to step back at this point and consider the method separately from the actual assignment. Considering the general approach to the assessment will allow you to determine the most useful method and develop a useful assessment instrument.

### **Alignment**

Probably the most important consideration when choosing or developing an assessment method is whether it is aligned with the SLO. In other words, is what you are asking the students to do in your assessment going to provide you with solid evidence about whether or not they have achieved the desired outcome? If your outcome deals with a student's ability to make a persuasive speech, a research paper is not a good instrument to measure this outcome. If you are assessing a quantitative reasoning outcome which speaks to students' ability to interpret some particular statistical information, simply asking them to calculate something correctly will not tell you whether they have achieved that outcome.

Aligning outcomes with methods may seem like an obvious recommendation, but it is not uncommon to see a disconnect between the outcome and the assessment instrument when faculty are in the early stages of writing their outcome assessment plans. In some instances faculty end up revising their outcomes after working on their assessment instrument and that is okay.

### **Ease of scoring**

We all know that writing good multiple choice questions takes a lot of time, but scoring them is fast. Writing a good essay question is less time-consuming than grading a stack of student essays. With everything we do, we need to consider how much time it will take; you should consider the time involved in scoring the instrument and reporting the data. When choosing an assessment method you must weigh time against meaningful results. It may be challenging to find the balance, but the efforts of going through an outcome assessment plan won't be worth much if you cannot use the results to make decisions about the strengths and weaknesses of your course/program.



## **Assessment Techniques**

There are many techniques that may be used to assess student learning outcomes. In a number of cases, these assessment techniques may be embedded in course assignments or activities as measures of students' achievement of program goals as well as their attainment of the college's general education goals.

### **Capstone Courses**

Capstone courses are designed to enable students to review, evaluate, integrate, and synthesize information and skills gained from other courses in the program or major. These courses are the optimum place to assess many program or major goals and general education goals. A capstone course is one which completing students take as a culminating experience that gives them the opportunity to tie together the knowledge and skills of other program courses. If your program has such a course, you may want to consider the performance in this type of capstone course as an assessment method. Likewise, some programs assign a capstone project which can be evaluated.

### **Internships, Field experiences, Clinical Evaluations**

Internships, field, or clinical experiences are also ideal for assessing many program or major and general education goals. When these occur at the end of the program or major, they often serve as capstone experiences. It is especially useful to have external experts assess the performance of your students.

### **Authentic Assessment**

In some courses, opportunities can be found to ask students to engage in a simulation of a real-life problem that they must solve using the knowledge and skills they have gained in the course. A single project can be structured to assess both mastery of course content and attainment of program or major goals as well as certain general education goals such as communication skills, life-long learning skills, critical thinking skills, and social and education values. For example, students might be asked to assume the role of a city council member who must make a decision concerning a controversial issue. Students might then be asked to research both sides of the issue and to deliver a persuasive speech or to write an action plan.

### **Ill-defined or Ill-structured problems**

An ill-defined problem is one that is not highly structured and cannot be resolved with a high degree of certainty. Experts may disagree about the best solution. Examples: determining what really happened at Waco or solving the nuclear waste storage problem or predicting the effect of global warming or deciding if there is such a thing as global warming. Dealing with ill-defined problems requires the integration of many skills, abilities, areas of knowledge.

### **Portfolios**

An accumulation of student-produced work, a portfolio may be designed to assess a student's attainment of program or major goals. The same portfolio may also be used to assess general education goals such as communication skills or the development of skills to enhance life-long learning, such as the ability to use the library and other appropriate sources to retrieve information. Portfolios that contain early or unrevised work as well as later or revised work can assess the growth of skill development. Rubrics to judge portfolios must be clear and shared

with the student.

The Advisory Committee (who are working professionals in the field) judged the work in the portfolios using detailed criteria. This process assessed the individual student's work so that the student could remedy any problem areas during the last semester, and the analysis of the portfolios as a group indicated areas of concern for the program. The students then had something tangible to take with them on job interviews which showcased their work.

### **Curriculum Analysis Review**

This is a common assessment activity used by a number of occupational/technical programs. The Advisory Committee is particularly useful in curriculum review because they are generally practicing in the field and are aware of advances or changes. Often the advisory committee can give valuable insight by reviewing the goals and objectives to help plan future directions of a program. Tying a curriculum to a national standard may be a particularly valuable assessment technique.

The advantage of using this as one aspect of a program's assessment is that by using the advisory committee, local business/industry are getting a voice in whether the curriculum is meeting their needs. It is also an inexpensive assessment tool.

However, keep in mind that although we need to be sensitive to the needs of local business and industry, it is our obligation to prepare students to work outside our service area as well as within our own region. Generally, we can assume that the skills and knowledge needed in a certain field in our own region will serve a student well anywhere, but there may be instances where that does not prove to be the case.

### **Grades**

Grades can be used to assess student learning by using primary trait analysis (PTA) to identify the factors that count for scoring and explicitly stating the criteria for the evaluation of the assignment, project, presentation, product in the form of a rubric.

### **Course-embedded Assessment**

Program or major goals and general education goals may be assessed through assignments embedded in required courses. For example, writing assignments, such as summaries or reports, and oral presentations may be used to assess student' mastery of course content as well as their writing, reading, critical thinking or speaking skills and use of the library or other information source. With some planning, a single assignment or project can be designed to assess a number of different program or major goals as well as general education goals.

### **Critical Incidents**

Students can be asked to describe an incident, either real or imagined, that illustrates or illuminates key concepts or principles. An explanation of the concepts or principles illustrated should accompany the description of the incident.

**Case Study** Presented with a realistic example of an application in the field, students must respond with an analysis that demonstrates their mastery of course content and their ability to apply the information and skills they have learned. A case study is an examination of a specific

phenomenon such as a program, an event, a person, a process, an institution, or a social group. The end product of a case study is a rich, thick description of the phenomenon being studied that illuminates the student's understanding of the phenomenon through the application of the knowledge and skills they have gained.

### **Journals**

Journals or learning logs have been used in composition courses for years as a tool for increasing student writing and motivation for writing and for assessing students' writing skills. However, a journal that focuses on students' social and educational attitudes and values may be also useful to assess students' achievement of general education goals. Journals may also be used to assess student attainment of program or major goals.

### **Writing Samples**

Writing assignments can be used as a measure of students' mastery of course content and attainment of program or major goals. Such assignments may also be used as a direct measure of the general education communication skills goal as well as an indirect assessment of critical thinking skills. Examples of writing samples include essays, research or term papers, answers to essay questions on tests, book reports, summaries, lab reports, and the like.

### **Oral Presentations/ Oral Exams**

Depending on the nature and content of the course, oral presentations can be tailored not only to assess students' mastery of course content but also their attainment of general education goals such as critical thinking, general knowledge and historical consciousness, understanding the impact of science and technology, and educational and social values. Oral presentations based on course content can be used as a direct measure of students' communication skills.

### **Certification Tests**

Programs in which a student must pass a certification examination in order to be certified to work in the field, such as nursing, may want to consider using the results of that test as an assessment technique.

One advantage of doing that is that successful results demonstrate credibility of the curriculum. One disadvantage is that many organizations will not disclose students' results to the college (although individual students might).

### **Exit Interviews**

There are different types of exit interviews, but they commonly fall into two categories. In one type of exit interview the program head and students discuss topics similar to those found on student surveys. Topics can be very detailed and may result in information that you hadn't thought to request. Sometimes students will say things that they do not wish to put in writing.

The other type of exit interview is actually more like an oral examination. (Call it an exit interview has the advantage of not scaring students to death.) This method has been used very successfully by the Administration of Justice program, where the interviews are conducted by a panel made up of advisory committee members. It has the advantage of giving students practice in the kind of interviews that they face for the hiring process and future promotion boards and also assessed their proficiency in both oral communication and knowledge of their subject area.

## **Focus Groups**

Focus groups are structured but informal discussions with small groups of students. Students may be asked about issues that are pertinent to the program. Focus groups can also be conducted with faculty, advisory committees, administrators and other employees.

## **External Evaluation/Review**

This is a type of peer review where a consultant(s) from either business or another institution examines a program from an outside perspective. This may involve such things as visiting classes, interviewing faculty and students, interviewing advisory committee members, examining curriculum goals and objectives, reviewing final exams, and interviewing local business and industry. This method provides the opportunity for the exchange of ideas with a faculty member of another institution.

## **Course Tests and Exams**

Common test questions drawn from course content and included on tests and exams in all sections of the course can be used to assess both program or major goals and some general education objectives. A locally developed test gives you the opportunity to determine if specific desired outcomes are being successfully attained. It can be tailored to meet the objectives of your program. However, preparing a test takes a great deal of preparation and study.

## **Rubrics**

For scoring consistency with longer open-ended assignments such as essays, research papers, or performances, a rubric should be developed. A rubric is a criterion based scoring tool that specifies levels of achievement (e.g. exemplary, satisfactory, and unsatisfactory) for each dimension of the outcome. As part of the rubric, criteria are provided that describe what constitutes the different levels of achievement.

There are two major types of rubrics: holistic and dimensional (analytic) also known as primary trait rubric. Both detail the particular qualities that separate excellent from poor student work along a spectrum, but the first groups the dimensions together, while the second keeps them separate.

The holistic rubric looks at the instrument as a whole; students receive one overall score based on a pre-dimension scheme used by everyone. The dimensional (analytic) rubric yields sub-scores for each dimension, as well as a cumulative score which is the sum, either weighted or un-weighted, of the dimensional scores.

Each type of rubric has its strengths and weaknesses. Holistic rubrics allow you to look at a student's overall performance, and often it corresponds better to the grade that pops into our heads immediately after we finish looking at the student work. The dimensional (analytic) rubric provides more information about what is working and what is not. For example, perhaps students are doing a good job with learning the mechanics or writing, but not so well with learning writing development. A dimensional rubric will provide information with this level of detail, whereas a holistic rubric will not.

Regardless of the type of rubric, it is important tht it be shared with students well before the assessment is administered. It is unreasonable to expect students to perform well on an assessment if they do not have a clear understanding of the standards being used to evaluate it.

## **Surveys**

Surveys may be used to assess the degree to which students perceived that they have attained program or major goals as well as certain general education goals. Items that elicit this information may be included on surveys developed by program or major faculty and administered to current and/or prior students and on surveys sent to employers of program or major graduates.

The use of surveys is a way to gain information that may directly impact a program. There are many types of surveys. The ones most often used are graduate surveys, employer surveys and student surveys. Surveys allow you to get direct feedback from a number of perspectives such as employers and graduates. Results sometimes raise issues that would not be apparent in other types of assessment.

One disadvantage is that it is often time-consuming and expensive. It requires careful planning since a survey that is not thought through thoroughly may give you little useful information.

## **Standardized Tests**

Standardized tests are nationally normed and may also be used to assess students' perception of their attainment of general education goals. These tests best assess reading comprehension, critical thinking, scientific reasoning, the ability to solve math problems, and writing skills such as knowledge of grammar and correct usage. Additionally, there are major field tests which may be used to assess student learning.

When administered pre and post, standardized tests can be an effective way to measure achievement in a particular area. They have the advantage of credibility since they are nationally normed. However, these tests are often expensive and do not always match well with the curriculum. Our use of standardized tests in assessment has been limited in the past. We have found that although it is good for detecting general problem areas, it is sometimes quite difficult to discern more specific areas needing attention.

**Appendix F: SCHEV Productivity Report**  
**State Council of Higher Education for Virginia**

**Productivity Report**  
**For programs falling below productivity standards in numbers of graduates**

Programs exempt from this process: interdisciplinary programs in which no more than 25% of the major is comprised of courses other than those regularly offered by other programs.

Graduate programs with the same CIP code may be treated as a group, for which the standards will be cumulative. For instance, a combination master's/doctoral program will have a number –of-graduates standard of five.

**1. Five-year averages and SCH/FTEF**

- a. Average number of graduates and % of the total institutional graduates that they represent\*
- b. Average number of FTE majors and % of the total institutional FTE enrollment that they represent\*
- c. Ratio of program-generated SCH/FTEF.
- Data provided by SCHEV

**2. Results**

- a. Assessment results – measures of learning
- b. Graduates' satisfaction with i) education received, ii) support services, including advising, and iii) course availability (non-anecdotal, from surveys, telephone interviews, focus groups, etc.)
- c. Percent of graduates who i) are employed in program-related work, ii) are pursuing further study, or iii) identify the program as significantly contributing to their functioning as workers and citizens
- d. For programs in which there is a licensure examination—of graduates who take the examination, the percentage who fail as compared to the national average for that field

**3. Program costs and resources**

- a. Total direct program costs/SCH. The costs should include the following: Personnel (full-time faculty, part-time faculty, classified staff, other personnel) and Non-personal services (travel, equipment, library, supplies, accreditation costs, scholarships/fellowships, other).
- b. Outside revenues, by kind

Note: Costs and revenues may be averaged over a five-year period.)

**4. Length of program in number of credits.**

**5. Statement about plans for the program's future.**

## State Council of Higher Education for Virginia

### PROGRAM-REVIEW INDEX SCORING GUIDE

#### 1. Five-year averages and FTES/FTEF ratio

- a. 10 points if graduates are 74-99% of productivity standards  
5 points if graduates are 50-74% of productivity standards  
0 points if graduates are 49% or less of productivity standards
- a.1. addition of 3 points if average # graduates greater than 2% of average institutional graduates
- b. 10 points if FTES majors exceeds productivity standards (AA, AS FTE=25; AAS-17.5)  
5 points if FTE majors are 50-99% of productivity standards  
0 points if FTEs majors are 49% or less of productivity standards
- b.1. addition of 3 points if average fTE majors greater than 2% of institutional FTE
- c. 10 points if SCH/FTEF exceeds average SCH/FTEF at the institution  
5 points if SCH/FTEF is 50-99% of average SCH/FTEF at the institution  
0 points if SCH/FTEF is 49% or less of average SCH/FTEF at the institution

#### 2. Results

- a. 15 points if assessment of learning outcomes has been done on a regular and periodic schedule and results are used for program improvement.  
10 points if assessment has been done on a regular and periodic schedule but results have not been used for program improvement  
5 points if assessment has been done only for this program review  
0 points if no implementation of assessment
- b. 15 points if 75-100% of graduate satisfied with education, support services, and course availability (five points on each item)  
6 points if 50-74% of graduates satisfied with education, supports services, and course availability (2 points on each item)  
0 points if 49% or less of graduates satisfied with education, support services, and course availability OR if no record of graduate satisfaction
- c. 10 points if 75-100% of graduates are employed in program-related work, are pursuing further education, or identify the program as significantly contributing to their functioning as workers and citizens  
5 points if 50-74% of graduates are employed in program-related work, are pursuing further education, or identify the program as significantly contributing to their functioning as workers and citizens  
0 points if 49% or less of graduates are employed in program-related work, are pursuing further education, or identify the program as significantly contributing to their functioning as workers and citizens OR if no record of what graduates do
- d. reduction of 5 points if, of graduates who take the licensure examination, the percentage who fail that exam is above the national average for that field

**3. Program costs and resources**

- a. 30 points if annual costs/SCH is 50% or less of institutional average cost/SCH  
20 points if annual cost/SCH is 51-89% of institutional average cost/SCH  
10 points if annual cost/SCH is 90-110% of institutional average cost/SCH  
0 points if annual cost/SCH is 111% or more of institutional average cost/SCH

- b. up to five additional points if program faculty produce external funding directly related to educational mission of program

Note: Costs and revenues may be averaged over a five-year period.

**4. Length of program**

Associate degree – transfer---minus 5 points if more than 61 credits

Associate degree –occupational/technical—minus 5 points if more than 65 credits

**5. Statement about the program and its future**



## Appendix G: PDCCC Teaching Resources

### **PDCCC Library Teaching Resources & Assessment Bibliography**

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## Appendix H: Bloom's Taxonomy

**COGNITIVE** learning is demonstrated by knowledge recall and the intellectual skills: comprehending information, organizing ideas, analyzing and synthesizing data, applying knowledge, choosing among alternatives in problem-solving and evaluating ideas or actions.

Level	Illustrative Verbs	Definition	Example
Knowledge	arrange, define, describe, duplicate, identify label, list, match, memorize, name, order, outline, recognize, relate, recall, repeat, reproduce, select, state	Remembering previously learned information	Memory of specific facts, terminology, rules, sequences, procedures, classifications, categories, criteria, methodology, principles, theories, and structure
Comprehension	Classify, convert, defend, describe, discuss distinguish, estimate, explain, express, extend, generalize, give examples, identify, indicate, infer, locate, paraphrase, predict, recognize, rewrite, report, restate, review, select, summarize, translate	Grasping the meaning of information	Stating problem in own words, translating a chemical formula, understanding a flow chart, translating words and phrases from a foreign language
Application	Applying, change, choose, compute, demonstrate, discover, dramatize, employ, illustrate, interpret, manipulate, modify, operate, practice, predict, prepare, produce, relate, schedule, show, sketch, solve, use write	Applying knowledge to actual situations	Taking principles learned in math and applying them to figuring the volume of a cylinder in an internal combustion engine
Analysis	Analyze, appraise, break down, calculate, categorize, compare, contrast, criticize, diagram, differentiate, discriminate, distinguish, examine, experiment, identify, illustrate, infer, model, outline, point out, question, relate, select, separate, subdivide, test	Breaking down objects or ideas into simple parts and seeing how the parts relate and are organized	Discussing how fluids and liquids differ, detecting logical fallacies in a student's explanation of Newton's 1 <sup>st</sup> law of motion
Synthesis	Arrange assemble, categorize, collect, combine, comply, compose, construct, create, design, develop, devise, design, explain, formulate, generate, integrate, manage, modify, organize, plan, prepare, propose, rearrange, reconstruct, relate, reorganize, revise, rewrite, set up, summarize, synthesize, tell write	Rearranging component ideas into a new whole	Writing a comprehensive report on a problem-solving exercise, planning a program or panel discussion, writing a comprehensive term paper
Evaluation	Appraise, argue, assess, attach, choose, compare, conclude, contrast, defend, describe, discriminate, estimate, evaluate, explain, judge, justify, interpret, relate, predict, rate, select, summarize, support, value	Making judgments based on internal evidence or external criteria	Evaluating alternative solutions to a problem, detecting inconsistencies in the speech of a student government representative

Gronlund, N.E. (1981). *Measurement and Evaluation in Teaching*, 4<sup>th</sup> ed. New York, Macmillan Publishing.

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11/05/03

Revised 11/4/08

**Affective** learning is demonstrated by behaviors indicating attitudes of awareness, interest, attention, concern, and responsibility, ability to listen and respond in interactions with others, and ability to demonstrate those attitudinal characteristics or values which are appropriate to the test situation and the field of study.

Level	Illustrative Verbs	Definition	Example
Receiving	Asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits erect, replies, uses	Willingness to receive or attend	Listening to discussions of controversial issues with an open mind, respecting the rights of others
Responding	Answers, assists, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes	Active participation indicating positive response or acceptance of an ideas or policy	Completing homework assignments, participating in team problem-solving activities
Valuing	Completes, describes, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works	Expressing a belief or attitude about the value or worth of something	Accepting the ideas that integrated curricula is a good way to learn, participating in a campus blood drive
Organization	Adheres, alters, arranges, combines, compares, completes, defends, explains, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes	Organizing various values into an internalized system	Recognizing own abilities, limitations, and values and developing realistic aspirations
Characterization by a value or value complex	Acts, discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, uses, verifies	The value system becomes a way of life	A person's lifestyle influences reactions to many different kinds of situations

Gronlund, N.E. (1981). *Measurement and Evaluation in Teaching*, 4<sup>th</sup> ed. New York, Macmillan Publishing.

McBeath, R.J. (Ed.). (1992). *Instructing and Evaluating in Higher Education: A Guidebook for Planning Learning Outcomes*. Englewood Cliffs, NJ: Educational Technology

**PSYCHOMOTOR** learning is demonstrated by physical skills: coordination, dexterity, manipulation, grace, strength, speed; actions which demonstrate the fine motor skills such as use of precision instruments or tools or actions which evidence gross motor skills such as the use of the body in dance or athletic performance.

Level	Illustrative Verbs	Definition	Example
Perception	Chooses, describes, detects, differentiates, distinguishes, identifies, isolates, relates, selects, separates	Using sense organs to obtain cues needed to guide motor activity	Listening to the sounds made by guitar strings before tuning them, recognizing sounds that indicate malfunctioning equipment
Set	Begins, displays, explains, moves, proceeds, reacts, responds, snobs, starts, volunteers	Being ready to perform a particular action: mental, physical or emotional	Knowing how to use a computer mouse, having instrument ready to play and watching conductor at start of a musical performance, showing eagerness to assemble electronic components to complete a task
Guided response	Assembles, builds, calibrates, constructs, dismantles, displays, disserts, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, organizes, sketches	Performing under guidance of a model: imitation or trial and error	Using a torque wrench just after observing an expert demonstrate its use, experimenting with various ways to measure a given volume of a volatile chemical
Mechanism	(same list as for guided response)	Being able to perform a task habitually with some degree of confidence and proficiency	Demonstrating the ability to correctly execute a 60 degree banked turn in an aircraft 70 percent of the time
Complex or overt response	(same list as for guided response)	Performing a task with a high degree of proficiency and skill	Dismantling and re-assembling various components of an automobile quickly with no errors
Adaptation	Adapts, alters, changes, rearranges, reorganizes, revises, varies	Using previously learned skills to perform new but related tasks	Using skills developed learning how to operate an electric typewriter to operate a work processor
Origination	Arranges, combines, composes, constructs, creates, designs, originates	Creating new performances after having developed skills	Designing a more efficient way to perform an assembly line task

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