Assessment in Learning-Centered Institutions

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Why so much emphasis on assessment?

- Accreditation Expectations
- A Learning-Centered Focus

Academic Program Goals	Students learn: • The concepts, theories, research findings, techniques, and values of the discipline • How to integrate what they learn to solve complex, real-world problems • An array of core learning outcomes, such as collaboration, communication, critical thinking, information literacy, and leadership skills
Curriculum	• Cohesive program with systematically-created opportunities to synthesize, practice, and develop increasingly complex ideas, skills, and values—to develop deep and lasting learning
How Students Learn	• Students construct knowledge by integrating new learning into what they already know. • Feedback guides student improvement. • Students can learn, clarify ideas, and develop alternative perspectives through reflection and interpersonal interactions.
Course Structure	• Students engage in learning experiences to master course learning outcomes. • Grades indicate mastery of course learning outcomes.
Pedagogy	• Based on engagement of students • Help students be "intentional learners" (AAC&U; *greaterexpectations.org*)
Course Delivery	Faculty use a repertoire of teaching techniques to meet the needs of diverse students and to promote different types of learning outcomes, such as • Active learning • Collaborative and cooperative learning • Community-service learning • Homework and laboratory assignments • Lectures and discussion • Online learning • Problem-based learning
Faculty Instructional Role	• Design learning environments to meet student and program needs • Share interests and enthusiasm with students • Provide students formative feedback on their progress; grade student work • Mentor student development in and out of the classroom • Assess class sessions, courses, and programs to improve their effectiveness
Assessment	• Faculty use classroom assessment to improve day-to-day learning in courses (Angelo & Cross, *Classroom Assessment*, Jossey-Bass, 1993). • Faculty use program assessment to improve learning throughout the curriculum. • Faculty and others assess their impact to improve institutional effectiveness.
Campus	• Co-curriculum and support services are aligned to support learning. • Program reviews and campus decision-making are conducted within a "culture of evidence." • Recognition and reward systems value contributions to learning and encourage flexibility to uncover new ways to encourage/support learning. • Routine campus conversations on learning

The Cohesive Curriculum

- Coherence
- Synthesizing Experiences
- Ongoing Practice of Learned Skills
- Systematically Created Opportunities to Develop Increasing Sophistication and Apply What Is Learned

Alignment Matrix (Curriculum Map)

Course	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
100	I, D				I
101		I			D
102	D		D		D
103					D
200	D		D		
229					D
230			D, M		M
280					
290	M		D, M		M

I = Introduced, D = Developed & Practiced with Feedback, M = Demonstrated at the Mastery Level Appropriate for Graduation

Program Assessment

Program assessment is an on-going process designed to monitor and improve student learning. Faculty:

- develop explicit statements of what students should learn.
- verify that the program is designed to foster this learning.
- collect empirical data that indicate student attainment.
- use these data to improve student learning.

Assessment Steps

1. Define learning outcomes.
2. Check for alignment.
3. Develop a meaningful, manageable, sustainable assessment plan.
4. Implement the plan—collect assessment data.
5. Close the loop–collective reflection and action.
6. Routinely examine the assessment process.

Elements of an Assessment Plan

- How will each outcome be assessed?
- Who will collect and analyze the data?
- How will data be collected?
- When and how often will it be done?
- Who will reflect on the results? When?
- How will results, implications, and related changes be documented?

Quotations from the Wise and Experienced

1. "Assessment is an on-going process. We don't 'get it done'; we 'get on with it.'"
   Outcomes Assessment, Miami of Ohio
2. "Three cardinal rules for evaluation or assessment: 'Nobody wants to be evaluated, nobody wants to be evaluated, and finally, nobody wants to be evaluated.'"
   Frank Newman
3. "Much of the literature on assessment suggests, and the Task Force agrees, that an institution will benefit from assessment only if faculty and cocurricular professionals see a use for the results and if they take the lead in formulating questions which assessment can help answer."
   Willamette Task Force on Outcomes Assessment
4. "Self-assessment is not the goal. Self-adjustment is the goal. That's what makes Tiger Woods and Michael Jordan great. That's what makes Socrates so impressive. That's what our best students and teachers do. They self-adjust, with minimal effort and optimal effect."
   Grant Wiggins
5. "Assessment per se guarantees nothing by way of improvement, no more than a thermometer cures a fever."
   T. J. Marchese
6. "While in the process of developing new outcomes/objectives, the department or administrative unit can easily identify assessment procedures that will be so time- and resource-consuming that they will become an end in themselves and not a means of determining whether a specific outcome/objective has been achieved. If this occurs, the long-term result is likely to be abandonment of the process."
   James O. Nichols
7. ". . . institutional evaluation should use objective data where available and purposeful but make no apologies for using subjective data. Or, it is better to be generally right than precisely wrong."
   R. L. Miller
8. "The most important thing about assessment is that it promotes dialogue among faculty."
   Mary Senter

Questions to Help Determine Learning Outcomes

Write out answers to these questions in sufficient detail that others can agree on what the outcomes mean and whether or not students have obtained them.

1. What important cognitive skills do I want my students to develop?
2. What social and affective skills do I want my students to develop?
3. What metacognitive skills do I want my students to develop?
4. What types of problems do I want them to be able to solve?
5. What concepts and principles do I want my students to be able to apply?

Draw upon the work of national or state professional groups and consult with colleagues.

Generic Skills List
(cross disciplines)

1. Communicating clearly
2. Questioning
3. Formulating problems
4. Thinking and reasoning
5. Solving complex, multi-step problems
6. Synthesizing knowledge from a variety of sources
7. Using cooperation and collaboration

Big Ideas, Skills, Concepts, Processes & Techniques
(characterize a specific discipline)

1. Developing a hypothesis (hunch)
2. Designing experiments (tests)
3. Drawing inferences from data
4. Using observation and analyzing similarities and differences in phenomena
5. Working with laboratory (test) equipment or tools
6. Re-testing to ensure repair was correct
7. Complete write up of process, findings, repair if required

Adapted from Herman, Joan, et. Al. *A Practical Guide to Alternative Assessment*

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Plan for Electricity Program-Level Assessment

The Program Curriculum

The Electricity program awards both an Associate Degree and a Certificate of Achievement. Students must complete a total of 45 units, of which 40 are core subject offerings. Certificates of Completion are awarded at the conclusion of one or several courses in the program to denote milestones of accomplishment. The requirements for all of these awards are listed in the college catalog.

	Core Required Day Courses	Core Required Evening Courses
1st Course	ELECT 200A	ELECT 204, 210A, 240, 202
2nd Course	ELECT 200B	ELECT 209, 210B, 242
3rd Course	ELECT 200C	ELECT 212, 210C, 242
4th Course	ELECT 200D	ELECT 214, 210D, 245, 250
	ELECT 253	ELECT 253
	ELECT 225	ELECT 225
	ELECT 435A	ELECT 435A

Day Program Courses

ELECT 200A	First Semester Industrial Electricity
ELECT 200B	Second Semester Industrial Electricity
ELECT 200C	Third Semester Industrial Electricity
ELECT 200D	Fourth Semester Industrial Electricity
ELECT 253	OSHA Standards for Construction Safety
ELECT 225	Algebra & Trigonometry for Technicians
ELECT 435A	Electrical Motor Control

Evening Program Courses

ELECT 204	First Semester Fundamentals of DC Electricity
ELECT 210A	Laboratory Practices
ELECT 209	Second Sem Fund of Motors/Generators
ELECT 210B	Laboratory Practices
ELECT 212	Third Semester Fund of AC Electricity
ELECT 210C	Laboratory Practices
ELECT 214	Fourth Semester AC Principles & Pract
ELECT 210D	Laboratory Practices
ELECT 240	Electrical Code-Residential
ELECT 202	Electrical Mathematics
ELECT 242	Electrical Code-Grounding
ELECT 245	Electrical Code-Commercial
ELECT 250	Electrical Code-Advanced

Recommended Courses

A listing of 19 additional courses is provided for students to select offerings that are recommended as instruction that would complement and extend the required curriculum. In all cases these courses are required elements of other related programs. These courses include:

Networking Cabling Installation
Cisco Networking I, Introduction
Technical Applications of Minicomputers
Electrical Motors and Transformers
Solid State Fundamentals for Electricians
2 Variable Speed Drives
Industrial Drive Systems
Robotics Technology
Electrical Cost Estimating
2 Electrical Pipe Bending
Blueprint Reading for Electricians
Traffic Signals Systems 1
Traffic Systems Communication
Traffic Signal Controllers & Digital Systems
Electrical Motor Control
AutoCAD I, Fundamentals
Basic AutoCAD for Architecture

Plan for Electricity Program-Level Assessment

Assessment Plan Notes

		Electricity Core Courses Required						
#	Learning Outcomes	1st Crs	2nd Crs	3rd Crs	4th Crs	ELECT 253	ELECT 225	ELECT 435A
1	Be technically competent: Perform basic wiring tasks.	3	3	3	3			3
2	Be technically competent: Complete circuit box panel schedules Demand factors Load cycles	2	2	3	3			
3	Be technically competent: Trouble shoot successfully Identify symptoms Diagnose problem Fix problem Test fix to verify problem solution	3	3	3	3			3
4	Be technically competent: Install electrical wiring or equipment to national electrical code standards	3						
6	Recognize safe work practices	1	1	1	1	3		1
6	Demonstrate safety practice during lab work	1	1	1	1	1		1
7								
8								

A possible rating scheme is to code each cell using this approach.

0- Course does not include instruction and assessment of this outcome.

1- Course includes instruction or practice of the outcome, and performance/knowledge of this outcome is assessed.

2- Course includes instruction or practice in the outcomes of this outcome, performance/ knowledge is assessed, and 20% or more of the course focuses on it.

3- Course includes instruction or practice in the outcome, performance/knowledge is assessed, and 1/3 or more of the course focuses on it.

The purpose of completing a matrix like the one above is to get an overall feel for the extent to which each program learning outcome is being addressed throughout the required courses and to what extent it is addressed where.

Plan for Electricity Program-Level Assessment

Expanded Statement of Purpose: Prepare students for entry level positions in the field of electrical technology.

Intended Educational Outcomes:	Means and Criteria for Assessment:	Results of Assessment:	Use of Results:
1. Be technically competent • Perform basic wiring tasks. • Accomplish bends in conduit • Complete circuit box panel schedules o Demand factors o Load cycles o Wire sizes o Circuit breakers • Trouble shoot successfully o Identify symptoms o Diagnose problem o Fix problem o Test fix to verify problem solution • Install electrical wiring or equipment to national electrical code standards	1A. Worksheets on parts of the residential site wiring diagram and other lab projects are scored with an instructor rubric for accuracy. 85% of the students will achieve an overall accuracy score of 75% or better (see the accuracy column of the related example ELECT 200A grading rubric) 1B. Within either ELECT 200D or 214 students will successfully create an industrial building wiring plan which is evaluated by an instructor grading rubric for accuracy, completeness, and neatness. • Wiring layout document • Lighting document • Title 5 documents • Panel schedules • One-line diagram 95% of the students will achieve an overall score of 75% or better 1C. Within ELECT 435A students will successfully • Recognize electrical symbols • Prepare a wiring design • Demonstrate component knowledge • Troubleshoot circuit errors The project is evaluated using an instructor grading rubric for accuracy, completeness and neatness. (see the related ELECT 200A grading rubric and the lab task process notes below for examples of these criteria)		

Plan for Electricity Program-Level Assessment

Intended Educational Outcomes:	Means and Criteria for Assessment:	Results of Assessment:	Use of Results:
2. Recognizes safe work practices	2. Within ELECT 253 students will complete an exam in each of eight modules with the OSHA minimum test score of 80% correct overall.		
3. Demonstrates work safety in the laboratory	3. Instructor observations during labs will result in no cases of safe work practices.		
4. Employers will be satisfied with the competence of program graduates.	4. Of those employers who respond to a mailed survey, ___ % will report satisfaction with the training provided by the program.		

ELECT 435A Laboratory Task/Process and Assessment Procedures Description

1. Students simulate the task on the computer
2. Students wire the lab task which is evaluated by the instructor on
    a. neatness
    b. proper connections
    c. proper routing
3. Students test the operation by
    a. completing a check sheet of ohm meter readings
    b. complete the expected readings for the balance of the circuit diagram
    c. record the actual results
    d. synthesize by comparing the actual recorded to the expected results
4. Energize the circuit and verify proper operation after the instructor has signed off on the work in item 3 above
5. Instructor injects faults to the circuit which are typical in the industry without the student present
6. The students trouble shoot and correct faults by doing the following to record their thought processes. All of the faults must be located or the circuit will not operate.
    a. List each fault located
    b. Describe the cause of he fault
    c. What was malfunctioning that caused the fault?
    d. What did the student do to correct the fault
7. Student prepares their box for final inspection.