

# IREC

## **All About Assessments:** GUIDANCE FOR APPLICANTS **FOR THE IREC CREDENTIAL**

BASED ON IREC STANDARD 01023:2013



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This document is intended to give training providers guidance for their assessment of students, and help them meet relevant requirements of IREC Standard 01023:2013 for the accreditation of clean energy technology training.

The Standard does not require specific methodologies for any aspect of conducting assessments (examinations). However, it does require key elements that should be considered when evaluating or creating an assessment system and conducting assessments of students. Given the increasing prevalence of online courses and the use of electronic media for learning, it is important to understand that requirements in the Standard apply to all learning environments, and there may be additional considerations that should be addressed for online testing.

### **What does IREC Standard 01023 Require for Student Assessments?**

There are two requirements that training providers applying for accreditation under Standard 01023 are required to address regarding how they assess student learning. The requirements are in accordance with accepted best practices based on standards set by the testing industry. This is to ensure that training providers give assessments that are fair, valid and reliable, and measure student attainment of the learning objectives.

#### **8.3 Student Learning Assessment Methodology**

**8.3.1 Required Assessment:** The training provider shall evaluate student learning outcomes using assessments that are measurable, objective, criterion-referenced, and authentic.

**8.3.2 Assessment Framework:** The training provider shall have written policies and procedures for assessment development, delivery, administration, scoring, scoring analysis, and review to ensure that students are meeting the stated learning outcomes.

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### **Why is Assessment of Students Important?**

- *You are spending time and resources trying to achieve student learning – is it working?*
- *When you claim to be training individuals in knowledge and skills for specific jobs and careers, do you have evidence of your claims?*
- *You have the impression that your students are weak in areas X & Y – would more systematic research back up this impression and help you understand weakness in students' learning? How can you best address the problem?*
- *How can you improve learning most effectively in a time of tight resources?*

*Assessment Clear and Simple, Barbara E. Walvoord, 2004*

## **Why does the IREC Standard require training providers to develop and maintain their own assessments?**

Effective assessments measure whether the learning objectives stated in the training curriculum are met. Use of a third-party certification examination, or assessments developed for other purposes do not measure the attainment of learning objectives specific to training. Data provided by an assessment at the level of the learning objective is important information to help the training provider determine if students will perform effectively on the job in specific areas, and change and improve curriculum content and delivery. For example, if assessment results demonstrate that students have not mastered specific skills, or that there are learning objectives not met, this feedback should be used to inform evaluation of your training program and corrective actions to improve results.

### **Understanding Key Concepts**

The goal of the assessment is to measure student acquisition of skills and knowledge. Therefore, the assessment, whether it is given as a quiz, final exam, or hands-on lab test should provide direct feedback on how well a student as related to a specific learning objective. The Standard provides this definition for learning objectives:

**Learning Objectives** — Measureable and observable statements of student outcomes. Learning objectives typically have three components: conditions statements, behavior or action, and a performance standard. They are used as guides to develop tests and assessments.

Two key terms in requirement 8.3.1 are defined in the IREC Standard:

**Authentic Assessment**—An assessment where students are evaluated as they perform real-world tasks that shows they have mastered the essential knowledge and skills necessary for their work. All assessments should be valid and reliable.

**Criterion-Referenced Assessment**—A criterion-referenced assessment that measures the student’s attainment of the learning objectives, but does not assess how well the student performs compared to other students.

The requirements in the Standard call for assessments to be authentic and criterion-referenced. This is so a student who performs well on the assessment has demonstrated mastery of the knowledge needed for the relevant job and the ability to execute the skills to perform required tasks.

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*We use learning objectives to design a test or assessment. We want students to apply their skills and knowledge by figuring out the answers to the questions just as they would if they were performing on the job.*

*Good Teaching Matters, Barbara Martin, Ph.D., 2010*

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### **The Assessment Framework**

Just as assessment is a part of a larger instructional system, the assessment framework has component elements that function together and need to be revisited and updated regularly.

- a. Clear policies and procedures need to be in place to guide assessment development, maintenance, administration, security and privacy.
- b. Students need to be informed about when, where and how assessments will be given and scored.
- c. The training provider should be able to support how they determine the types of assessments used.
- d. A process for exam development needs to be in place so attainment of learning objectives is assessed fairly and accurately.
- e. An ongoing procedure to review and revise the assessments and/or the assessment process should be established and followed.

These elements of the assessment framework are described further in following sections.

### **Development and Maintenance of Assessments**

The training provider should be able to articulate why they have chosen a particular type of assessment or assessment questions. Regardless of the type of assessment chosen, each question or performance objective should be linked directly to one or more learning objectives.

Evidence should be provided to show this linkage, for example, mapping questions or performance requirements to the learning objectives. This practice will assist the training provider in selecting a specific assessment type (e.g., multiple choice, performance, and essay) and in test question development.

Competencies → Learning objective → Testing method and questions

The training provider should have an assessment plan that describes how exam items are securely developed and securely maintained. This should include security of assessments (whether hard copy or online) and relevant policies pertaining to access of the assessment items and what the program does with materials used in the development of the examinations.

Likewise, the plan should describe the frequency and method of examination review and the qualifications of the reviewers, whether they are instructors, other staff members or industry contributors. Involving stakeholders and using subject-matter experts in the development and review process ensures that tests remain accurate and relevant to the job.

When developing, or reviewing, exam items, training providers should plan/describe, how item quality, relevance and accuracy are considered when developing exams. For written exams (whether administered online or in-person), one possibility is to track item response rates (correct/incorrect) to assist with reviewing exam question performance. Such item statistics verify if the test is performing well, that the questions on the assessment are measuring what they are purported to, and no student is disadvantaged by poorly performing questions.

### **Administering Assessments**

Administering assessments requires attention to the testing environment, testing personnel and the special needs of students. The training provider needs to demonstrate how each person taking the exam is provided a standard and uniform testing environment. This includes procedures that safeguard student privacy and confidentiality and to guard against cheating. This is done in fairness to the test-taker, so no one is advantaged or disadvantaged by different testing circumstances.

The testing environment for written examinations should be comfortable and as quiet as possible. The room set-up, equipment and what students are or are not permitted to use and bring should be the same; regardless of location and for each time the test is given. Examinations administered online lead to special considerations that should be addressed in the provider's procedures.

For performance examinations the testing environment should also ensure comfort and security. Examinations requiring the use of equipment must be set up in a consistent manner and under the same conditions, e.g. environmental, lighting, calibration of equipment, what you are or are not permitted to use and bring, etc. for each student. This not only ensures that no test taker is advantaged or disadvantaged by circumstances, but also that instructors/evaluators are making consistent judgments.

Instructors or other staff members should receive clear instructions to securely and correctly administer examinations. Written instructions will contribute to standardization, will guide staff in conducting the exams, and will assure that no test taker is advantaged or disadvantaged by differing practices - for example, not receiving adequate instructions on how to fill in question sheets, use of calculators or scratch paper, time allowed to test, etc. There should also be a procedure in place that allows the training provider to monitor exam administrators. The goal of the monitoring is to assure consistency among administrators.

Students with documented special needs should be given whatever assistance is aligned with their need request. Examples of accommodations include, but are not limited to, extra exam time, large print books, or print exams in place of computer exams. The IREC Standard does not require a specific method for determining which students should be afforded accommodations, but the training provider's policies and procedures should address this to ensure fairness and consistency.

### **Scoring Assessments**

While there are a variety of ways to assess learning, all assessments are required to be scored objectively and consistently. The score needed to pass a written examination must be identified using an accepted process based on the amount of specific knowledge exhibited (criterion-referenced), and not solely on the percentage of people passing the examination. The process of determining a test passing score involves instructors and other subject-matter-experts making judgments about who has mastered which learning objectives that are based on the knowledge and skills specified in the relevant job task analysis.

While factors like course attendance and participation can be considered with respect to a final course grade, they should not play a role in scoring of any assessment.

When scoring assessments, a process must be in place allowing the instructor or grader/evaluator the ability to compare performance against objective written criteria. This can include a checklist, scoring rubric or other instruments. Rubrics are often used in scoring student performance because they provide an objective external standard against which student performance can be compared. Each rubric consists of a set of scoring criteria and point values associated with these criteria. In most rubrics the criteria are grouped into

## Rubric

A term often used for scoring authentic assessments, a rubric is a scoring tool that identifies the criteria relevant to a learning outcome, and then explicitly states the possible levels of achievement along a continuum (e.g. poor to excellent or novice to expert). Rubrics can be used to assess almost any type of student work, be it essays, oral presentations, lab exercises, or field performances. They can be used at the time an assignment is given to communicate expectations, when student work is evaluated for fair and efficient grading, and to even assess a program.

categories so the instructor and the student can discriminate among the categories by level of performance.

A consistent and objective scoring methodology will produce valuable data about what your students have learned.

Score reports and scores are important and should provide test-takers with feedback on their exam performance specific to the content areas of the exam. For example, the score report can include the major content areas of the exam, and a scale of the student's performance in the content area—for example, high, medium or low. Knowing this will enable students and their instructors to address areas in which students did not attain the learning objectives for the course. Students should be told when to expect to receive their score reports following the administration of each assessment.

Results of student assessments should inform evaluation of the training program and should be included in program review and modification.

### **Information for Students**

At the onset of the course, training providers are required to clearly communicate to students when, where and how assessments will be given. Written notification needs to be provided at the beginning of the training so students know what to expect. This is information typically provided along with other program information in a course syllabus or as a separate handout. This information should include:

- a. Assessment type(s).
- b. Length of the assessment.
- c. Description of how the assessment is aligned with the training.
- d. Any requirements to pass the assessment.

### **Summary**

- Assessments are based on specific learning objectives.
  - Use information from student performance on assessments to determine how they will perform on the job.
  - Assessments should inform program review and modification (including curriculum and delivery).
- A criterion-referenced assessment is simply a quiz, test, evaluation of hands-on physical skill or other evaluation of an individual student's skills against a specified standard, rather than against other students' performance.
- Plan for fair and consistent administration and regular review of each assessment for accuracy and relevance to the job.
- Develop a passing score based on the information that the student must master in order to perform well on the job.

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***Want to learn more? See these IREC publications for assessment best practices:***

*Good Teaching Matters, Barbara Martin, Ph.D., 2010*

*Solar Energy Training Education & Training Best Practices, #3 Developing a Quality Course, Barbara Martin, Ph.D., 2012*