

**Annual Report Assessment {SAC}: Department of Trades and Industry
Facilities Maintenance Technology
Electrician Apprenticeship Technologies**

Changes Made after the Annual 2010-2011 Assessment Report:

We have made changes to our Co-Op work Experience evaluation form so that Co-Op employers can better identify our students' technical skill level. We have added a Lab Technician into the classroom in order to assist instructors in courses where there is ongoing hands-on evaluation of student skills, especially during lab sessions. We have upgraded, through both donations and through direct purchase, the diversity and quality of HVAC/R equipment which you use as part of student assessments. We have, through conferencing sessions with appropriate instructors, re-emphasized the importance of soft skill training, centered on customer service, in most of our FMT, ELT, and APR courses.

Facilities Maintenance Technology

For this Second Year Annual Assessment Report, the Department of Trades and Industry assessed student performance of the following Degree Outcomes for the AAS in Facilities Maintenance Technology (FMT):

- Communicate effectively through appropriate media with co-workers, customers, contractors, suppliers, and supervisors
- Actively search for continuous improvement by analyzing the workplace for effectiveness and efficiencies

Methods:

For the outcome: "Communicate effectively through appropriate media with co-workers, customers, contractors, suppliers, and supervisors", we continued to use our course FMT 102- Refrigeration II. During several of the lab sessions in FMT 102, each student must work in a team to write a work order and then perform service on a commercial refrigeration system, such as a reach-in cooler or freezer. The student team must then verbally walk the instructor through the entire process of completing the work order to the satisfaction of that instructor, before a passing grade is given. The instructor uses a written check list to track proper procedures. The work orders and checklists are saved by the instructor. This year

we have had a lab technician assist the instructor during these lab sessions to help assure accuracy and to keep the work time reasonable for each student team. Passing the labs and the course means satisfactory completion of these real world tasks on real world equipment.

Results:

We collected and analyzed the final grades and work orders for two sections of FMT 102 students. The first section had 20 students and the other had 12 students. All but one of the 32 students passed with a letter grade of "A". The one student received a "C" and our Lab Technician spent additional time with the student for more practice.

Methods:

For the outcome: "Actively search for continuous improvement by analyzing the workplace for effectiveness and efficiencies", we collected and analyzed the final exam results for one section each of two courses, FMT 113 – Refrigeration Electrical III with 14 students and ELT 126 – Intermediate Programmable Controllers with 19 students. Both of these courses center heavily on troubleshooting and diagnosis of many different types of HVAC/R equipment using primarily electronic control systems. For both courses the training is mostly "hands-on" and a student must actively solve problems using electrical instruments such as clamp on electrical meters or a software program. This is very similar to the diagnosis and fine tuning of whole building systems for efficiency now done in facilities everywhere. After passing these classes, especially the Lab portions of these classes, a student should be able to perform the same tasks out in real world of facilities maintenance.

Results:

Of the 14 FMT 113 students, 9 received an "A" grade and 4 received a "B" grade. One student received an "F" for failing to attend class.

Of the 19 ELT 126 students, all received an "A" grade.

Identify Changes That Should Be Implemented:

For the Facilities Maintenance Technology Program we have identified two changes that we have already implemented but which we will make permanent as a result of this second year assessment. One is the practice of having a Lab technician assist the instructor in courses where a “hands-on” assessment of student learning is taking place. This practice saves time and ensures that all students get equal time. The second is to find the means, either through purchase or donation, to provide the best and most up-to-date equipment on which students will be evaluated.

Electrical Apprenticeship Technologies

For this Second Year Annual Assessment Report, the Department of Trades and Industry assessed student performance of the following Degree Outcomes for the AAS Degrees in Electrician Apprenticeship Technologies: Limited Manufacturing Plant Electricians, Limited Maintenance Electricians, and Stationary Engineers:

- Complete 4000, 6000, or 8000 hours – State of Oregon - approved on- the job- training – Hours may vary by trade
- Apply theory to electrical wiring
- Repair and install electrical wiring devices according to licensure regulations to meet NEC and OSC for Inside Electrician, Limited Energy Technician - License A, Limited Manufacturing Plant Electrician, Sign Assembler /Fabricator, Sign Maker/Erector, Stationary Engineer, Limited Energy Technician – License B, Limited Maintenance Electrician, Limited Renewable Energy technician, and Limited Residential Electrician (2.2008)

Methods:

Because the real and final assessment for students in any of our Departments’ three Apprenticeship Programs is that, when a Student/Apprentice has finished either the four year or two year courses in the APR Curriculum, he/she can competently take and pass the State of Oregon Examination for their specific Oregon State Electrical License. Our best assessment tool, of whether a student is prepared for this final hurdle on their way to journeyman status as an

electrician, is the final examination results for two courses, APR 204 – LME Electrical Code – Level III (the final level) and APR 226 – Electrical Code- Level III (also the final level). These two courses are the National Electrical Code, Oregon Specialty Code, and Oregon Administrative Rules preparation courses that are taken just prior to an Apprentice going before the state for the last testing before licensure. We, therefore, collected and analyzed the results of the final exams for both courses. APR 204 had 21 students and APR 226 had 17 students.

Results:

For APR 204, the results were that 49% passed with an 80% or above, 33% passed within a 70% to 79% range, and the other 19% failed at 69% and below. These results were less than we had hoped they would be, and we could not identify any single subject with which students had the most trouble.

For APR 226, the results were much better with all 17 students in the 80% or above range. Students in this course, however, seemed to struggle most with calculations sections of the National Electrical Code.

Identify Changes that should be implemented:

The real assessment of our Apprenticeship Students lies in two areas. One area is the On- the- Job -Training Hours (OJT). The other area is the curriculum and class content that helps prepare them for the ultimate test, the State Electrical Examination.

An Apprentice's ability to hold and keep employment with their Training Agent is the real evaluation of the OJT Hours.

The real assessment for the APR courses is whatever tools we can find or create. We have concluded that we need to look for a better assessment tool and better way of identifying in which areas of the exam preparation our Apprentices are having difficulty. For example we will probably add an ongoing evaluation of student quizzes to the assessment mix instead of relying only on the final examinations for both APR 204 and APR 226. This assessment tool needs to be improved.

