

# Assessment: Course Four Column

## Courses (CTE) - Electrical Systems Technology

### ELM 143:Wiring Techniques

<i>Course Outcomes</i>	<i>Assessment Measures</i>	<i>Results</i>	<i>Actions</i>
<p><b>Hand and power tools used in electrical industry</b> - Identify and use hand and power tools used in the electrical industry</p> <p><b>Course Outcome Status:</b> Active <b>Next Assessment:</b> 2023-2024</p>	<p><b>Assignment - Lab</b> - Use of the various hand and power tools contained within the electrical tool room to include drills, hole saws, conduit benders, knock-out sets, voltmeters, AC/DC Clamp. On meters, Meggers, power monitoring equipment</p> <p><b>Criterion:</b> Watched the students use a variety of drills, saws, crimpers, all types of hand tools, ratcheting cutters, hole-punching sets,etc.</p>	<p><b>Reporting Period:</b> 2018-2019 <b>Criterion Met:</b> Yes</p> <p>All students demonstrated an adequate proficiency in the use of hand tools and power tools of various types.</p> <p>Results Analysis: I felt all students handles the power and hand tools safely and effectively. (09/04/2019)</p>	<p><b>Action:</b> Use of our tool sets labs would be more beneficial and help students to have a better understanding of how to use them safely. Our new Milwaukee Battery Powered Crimper was used for making a high-voltage cable splice recently and all students got to participate. (09/04/2019)</p>
<p><b>Test equipment</b> - Identify and use test equipment used in the electrical industry.</p> <p><b>Course Outcome Status:</b> Active <b>Next Assessment:</b> 2023-2024</p>	<p><b>Assignment - Lab</b> - Students use a variety of test equipment primarily testing for Voltage, Current, or Resistance. They also check for 3 phase power and current, have an opportunity to measure Frequency on VFD's.</p> <p><b>Criterion:</b> Observe all students as the used a variety of test equipment both in and out of the class.</p>	<p><b>Reporting Period:</b> 2018-2019 <b>Criterion Met:</b> Yes</p> <p>All students performed well in their use of test equipment in a safe and productive manner.</p> <p>Results Analysis: Student need to received additional work on residential panels, load centers, and large molded-case breakers. (09/04/2019)</p>	<p><b>Action:</b> All the motor cubicles have had a new power panel installed at their entrance to enable more hands on experience with breakers, conductors, terminations, etc. (09/04/2019)</p>
<p><b>Troubleshooting electrical equipment</b> - Describe various methods for troubleshooting</p>	<p><b>Assignment - Project</b> - Using a Digital Multi-Meter, students were taught to check for short-circuits,</p>	<p><b>Reporting Period:</b> 2018-2019 <b>Criterion Met:</b> Yes</p> <p>All student did very well on troubleshooting. There we no</p>	<p><b>Action:</b> Plan for additional troubleshooting time during switch design, where the students</p>

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<p>electrical equipment.  <b>Course Outcome Status:</b> Active  <b>Next Assessment:</b> 2023-2024</p>	<p>resistance checks (fuses) and testing overload contacts using the tie-down method (Point-to-point) or to check for continuity  <b>Criterion:</b> Watched students perform these checks on Panel Boards, Single and Three phase panels, outlets, switchboards and motor labs.</p>	<p>accidents or injuries on live circuit testing. Performance was practiced on multiple scenarios and all results were achieved.   <b>Results Analysis:</b> You can never do enough troubleshooting. The more you do it, the quicker you are, your efficiency increases, as does your overall electrical knowledge. (09/04/2019)</p>	<p>can actually solve problems from their own circuits and make corrections. (09/04/2019)</p>
<p><b>Conductor terminations</b> - Describe how to make various conductor terminations.  <b>Course Outcome Status:</b> Active  <b>Next Assessment:</b> 2023-2024</p>	<p><b>Assignment - Lab</b> - For this exercise, we used mechanical and powered terminal connection devices. A working knowledge of temperature ratings of conductor ratings from the NEC is necessary here as is knowledge of max/min temp. rating of the terminations.  <b>Criterion:</b> Observed students making mechanical and powered conductor terminations on voltages from 120 VAC- 480 VAC. Stressed areas of the National Electrical Code they needed to be aware of specifically involving terminations. (110.14(C)).</p>	<p><b>Reporting Period:</b> 2018-2019  <b>Criterion Met:</b> Yes  The students did well on increasing their knowledge of conductors and temperature limitations and their correct installation.   <b>Results Analysis:</b> After doing their Codebook assignments and working hands on with solid and stranded wire, the students increased their working knowledge of this subject. (09/04/2019)</p>	<p><b>Action:</b> To improve in this area, plan to spend more time in the NEC in Article 310, Conductors, and conductor temperature limitations for electrical installations, Article 110. (09/04/2019)</p>
<p><b>Single phase and three phase electrical panel</b> - Describe how to make up a single phase and three phase electrical panel.  <b>Course Outcome Status:</b> Active  <b>Next Assessment:</b> 2023-2024</p>	<p><b>Assignment - Lab</b> - Physically unwired a 3 phase panel in the lab and had the students rewire it and remake all the single phase connections (outlets)   <b>Criterion:</b> Energized the rewired panel and took various voltage and current measurements.</p>	<p><b>Reporting Period:</b> 2018-2019  <b>Criterion Met:</b> Yes  All panels were rewired correctly with the students using their volt/current meters to make measurements.   <b>Results Analysis:</b> All panel projects were successfully completed. All voltage and current measurements were correct. (09/04/2019)</p>	<p><b>Action:</b> Action Plan: Plan additional time on 3 phase panels and their applications as this will be the type most commonly encountered in the industrial setting. (09/04/2019)</p>
<p><b>Safety procedures associated with electrical installations</b> - Describe various safety procedures associated with electrical installations.  <b>Course Outcome Status:</b> Active</p>	<p><b>Assignment - Lab</b> - LockOut/Tagout is stressed from the very first class. Proper Arc Flash clothing is worn during live work in the motor cubicles. Safety First signage is</p>	<p><b>Reporting Period:</b> 2018-2019  <b>Criterion Met:</b> Yes  A safe work environment is a productive environment. Lethal levels of voltage and current are encountered on a daily basis and must be in mind at all times.</p>	<p><b>Action:</b> Plan for additional Arc Flash information, Power Points on electrical safety, proper dress and correct tools. (09/04/2019)</p>

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<p><b>Next Assessment:</b> 2023-2024</p>	<p>everywhere throughout the lab.            Safety items are abundant on the competencies list.  <b>Criterion:</b> Observe all safety precautions are observed at all times.</p>	<p>Results Analysis: Continue to stress Lock Out/ Tag out efforts produced excellent results during live work with the students to ensure their complete understanding of this issue. (09/04/2019)</p>	