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| **Institution:** | Lamar State College Port Arthur | **Program Award Title and Level:** | AAS Instrumentation Technology |

| **Key Activities to WECM Courses Matrix** |
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| **Key Activity #/Statement** | **WECM Course Rubric, Number and Title** |
| ELMT 2333 Indusrial Electronics | INTC 1341 Principles of Automatic Control | INTC 1356 Onstrumentation Calibration | INTC 1343 Application of Industrial Automatic Controls | INTC 1301 Principles of Industrial Measurements | INTC 2336 Distributed Control & Programmable Logic | INTC 1348 Analytical Instrumentation |       |       |       |       |       |
| 1.1 Install pneumatic, electronic and digital controllers, and remote telemetry units. |   | x |   | x |   | x |   |   |   |   |   |   |
| 1.2 Install pneumatic, electronic and digital control valves, and self operated pressure regulators.  |   | x |   | x |   |   |   |   |   |   |   |   |
| 1.3 Install current to pneumatic (I/P), pneumatic to current (P/I), voltage to current (E/I), current to voltage (I/E), digital to analog, (D/A), and analog to digital (A/D) transducers. |   | x |   | x |   | x |   |   |   |   |   |   |
| 1.4 Install pneumatic, electronic and digital transmitters and measuring devices. |   |   |   |   | x |   |   |   |   |   |   |   |
| 1.5 Install pneumatic, electronic and digital relays and alarm panels. |   |   |   |   |   | x |   |   |   |   |   |   |
| 1.6 Install pH, conductivity, gas chromatograph, turbidity, infrared, combustible, ultraviolet, oxygen, lower explosive limit and other analyzers and sample systems. |   |   |   |   |   |   | x |   |   |   |   |   |
| 1.7 Install pneumatic, electronic and digital switches. |   | x |   | x | x | x |   |   |   |   |   |   |
| 1.8 Install electronic, digital and variable frequency drive (VFD) or variable speed drive (VSD) motor controllers. | x |   |   |   |   |   |   |   |   |   |   |   |
| 1.9 Install DCS, PLC and fieldbus process control networks. |   |   |   |   |   | x |   |   |   |   |   |   |
| 1.10 Install 600-volt or less motors and rotating equipment protection devices such as vibration monitoring and motor control relays. | x |   |   |   |   |   |   |   |   |   |   |   |
| 2.1 Maintain pneumatic, electronic and digital controllers, and remote telemetry units. |   | x | x | x |   |   |   |   |   |   |   |   |
| 2.2 Maintain pneumatic, electronic and digital control valves, and self operated pressure regulators. |   | x | x | x | x |   |   |   |   |   |   |   |
| 2.3 Maintain current to pneumatic (I/P), pneumatic to current (P/I), voltage to current (E/I), current to voltage (I/E), digital to analog, (D/A), and analog to digital (A/D) transducers. |   | x | x | x | x | x |   |   |   |   |   |   |
| 2.4 Maintain pneumatic, electronic and digital transmitters and measuring devices.  |   |   | x |   | x |   |   |   |   |   |   |   |
| 2.5 Maintain pneumatic, electronic and digital relays and alarm panels. |   |   | x |   |   |   |   |   |   |   |   |   |
| 2.6 Maintain pH, conductivity, gas chromatograph, turbidity, infrared, combustible, ultraviolet, oxygen, lower explosive limit and other analyzers and sample systems. |   |   |   |   |   |   | x |   |   |   |   |   |
| 2.7 Maintain pneumatic, electronic and digital switches. |   |   |   |   |   | x |   |   |   |   |   |   |
| 2.8 Maintain electronic, digital and variable frequency drive (VFD) or variable speed drive (VSD) motor controllers. | x |   |   |   |   |   |   |   |   |   |   |   |
| 2.9 Maintain DCS, PLC and fieldbus process control networks. |   | x |   | x |   | x |   |   |   |   |   |   |
| 2.10 Maintain 600-volt or less motors and rotating equipment protection devices such as vibration monitoring and motor control relays. | x |   |   |   |   |   |   |   |   |   |   |   |
| 3.1 Troubleshoot pneumatic, electronic and digital controllers, and remote telemetry units. |   |   | x |   |   |   |   |   |   |   |   |   |
| 3.2 Troubleshoot pneumatic, electronic and digital control valves, and self operated pressure regulators. |   |   | x |   |   |   |   |   |   |   |   |   |
| 3.3 Troubleshoot current to pneumatic (I/P), pneumatic to current (P/I), voltage to current (E/I), current to voltage (I/E), digital to analog, (D/A), and analog to digital (A/D) transducers. |   |   | x |   |   |   |   |   |   |   |   |   |
| 3.4 Troubleshoot pneumatic, electronic and digital transmitters and measuring devices. |   |   | x |   | x |   |   |   |   |   |   |   |
| 3.5 Troubleshoot pneumatic, electronic and digital relays and alarm panels. |   |   | x |   |   |   |   |   |   |   |   |   |
| 3.6 Troubleshoot pH, conductivity, gas chromatograph, turbidity, infrared, combustible, ultraviolet, oxygen, lower explosive limit and other analyzers and sample systems. |   |   |   |   |   |   | x |   |   |   |   |   |
| 3.7 Troubleshoot pneumatic, electronic and digital switches.  |   | x | x | x |   |   | x |   |   |   |   |   |
| 3.8 Troubleshoot electronic, digital and variable frequency drive (VFD) or variable speed drive (VSD) motor controllers. | x |   |   |   |   |   |   |   |   |   |   |   |
| 3.9 Troubleshoot DCS, PLC and fieldbus process control networks. |   |   |   |   |   | x |   |   |   |   |   |   |
| 3.10 Troubleshoot 600-volt or less motors and rotating equipment protection devices such as vibration monitoring and motor control relays. | x |   |   |   |   |   |   |   |   |   |   |   |
| 4.1 Repair or replace pneumatic, electronic and digital controllers, and remote telemetry units. |   | x |   | x |   |   |   |   |   |   |   |   |
| 4.2 Repair or replace pneumatic, electronic and digital control valves, and self operated pressure regulators. |   | x |   | x |   |   |   |   |   |   |   |   |
| 4.3 Repair or replace current to pneumatic (I/P), pneumatic to current (P/I), voltage to current (E/I), current to voltage (I/E), digital to analog, (D/A), and analog to digital (A/D) transducers. |   | x |   | x |   |   |   |   |   |   |   |   |
| 4.4 Repair or replace pneumatic, electronic and digital transmitters and measuring devices. |   | x |   | x | x |   |   |   |   |   |   |   |
| 4.5 Repair or replace pneumatic, electronic and digital relays and alarm panels. |   | x |   | x |   |   |   |   |   |   |   |   |
| 4.6 Repair or replace pH, conductivity, gas chromatograph, turbidity, infrared, combustible, ultraviolet, oxygen, lower explosive limit and other analyzers and sample systems. |   |   |   |   |   |   | x |   |   |   |   |   |
| 4.7 Repair or replace pneumatic, electronic and digital switches. |   | x |   | x |   |   |   |   |   |   |   |   |
| 4.8 Repair or replace electronic, digital and variable frequency drive (VFD) or variable speed drive (VSD) motor controllers. | x |   |   |   |   |   |   |   |   |   |   |   |
| 4.9 Repair or replace DCS, PLC and fieldbus process control networks. |   |   |   |   |   | x |   |   |   |   |   |   |
| 4.10 Repair or replace 600-volt or less motors and rotating equipment protection devices such as vibration monitoring and motor control relays. | x |   |   |   |   |   |   |   |   |   |   |   |
| 5.1 Maintain Heating Ventilation and Air Conditioning (HVAC) systems including the heater, condenser/evaporator, fans, filters and thermostats that control the temperature and/or humidity in a closed space. |   |   |   |   |   |   | x |   |   |   |   |   |
| 5.2 Maintain lighting systems including the indoor and outdoor lights, changing light bulbs, replacing fluorescent ballasts, checking breakers and switches.  | x |   |   |   |   |   |   |   |   |   |   |   |
| 5.3 Maintain backup power generation systems limited to low voltage generators (less than 600 volts) powered by diesel, gasoline or natural gas powered engines. | x |   |   |   |   |   |   |   |   |   |   |   |
| 5.4 Maintain cranes and/or hoists including the electric motors, controls and breakers. | x |   |   |   |   |   |   |   |   |   |   |   |
| 5.5 Maintain instrument air compressors including the compressor drive, compressor, filters, dryers and associated controls. |   | x |   | x |   |   |   |   |   |   |   |   |
| 5.6 Maintain plant communication systems such as Supervisory Control And Data Acquisition (SCADA) systems, handheld radios and transmitting or repeater stations, and intercom systems. |   |   |   |   |   | x |   |   |   |   |   |   |
| 5.7 Maintain Uninterruptible Power Supplies (UPS) and Inverters. | x |   |   |   |   |   |   |   |   |   |   |   |
| 5.8 Maintain cathodic protection systems. | x |   |   |   |   |   |   |   |   |   |   |   |
| 5.9 Maintain navigation aids including lights and switchgear associated with lighting systems required for navigation aids or warnings. | x |   |   |   |   |   |   |   |   |   |   |   |
| 5.10 Maintain high voltage equipment including equipment that is energized with 600 volts or more. | x |   |   |   |   |   |   |   |   |   |   |   |
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