Multi-State Advanced Manufacturing Consortium

US DOL SPONSORED TAACCCT GRANT: TC23767

MSAMC Master Performance Based Objectives (PBO) Review Template

Instructions

The following tab lists PBOs for the topic areas *Industrial Electricity*. Please review each of the PBOs, and rate each PBO with one of the following ratings:

1 = Skill or understanding is required for students.
2 = Skill is useful, but is not crucial for students to know.
3 = Skill is not useful for students, or isn't relevant for typical work assignments.
0 = PBO is unclear.

Additionally, for each PBO please

* Note any comments or recommendations that you may have about how to improve the PBO.
* Indicate whether each PBO is covered in your college's aligned courses, and how (written, lab demo, exercise).

If any PBOs or skill sets seem to be missing from the list, please add them in the space at the bottom of the list.

Please enter your information below	
Name:	
Institution:	
Date:	
Email:	
Phone:	

Industrial Electricity

M-S AMC Academic Partner PBO Review

Please enter your information below	
Name:	
Institution:	
Date:	
Email:	
Phone:	

Please indicate which course or courses delivered at your institution align with, or cover, the listed objectiv		
Aligned Course(s)	1	*Enter course code here*
	2	*Enter course code here*
	3	*Enter course code here*

*** Note**: For each covered PBO, indicate in which of the aligned courses, documented at left, the PBO would be most extensively covered. If there is only one course listed to the left, then you do not have to complete the "Aligned Course" column.

Sub-Topic	Level	Topic	PBO ID	Performance Based Objective (PBO)	Importance, 1 = Need 2 = Nice to have 3 = N/A 0 = Don't understand	Covered - Written Assignment / Reading? Y/N	Covered - Exercise or Assessment? Y/N	Aligned Course *	Comments *Notes to improve the PBO, PBO is unclear, lacking equipment to cover, etc.*
	1	ET	1	Safely work with electricity and electrical components.					
	1	ET	36	Match a list of the kinds of personal protection equipment to their proper description.					
	1	ET	37	Identify the level of current that poses a serious life-threatening condition to the human body.					
	1	ET	2	Match a list of safety practices to the electrical hazards they prevent.					
	1	ET	3	Match a list of the fundamental ways of generating electricity with examples of each.					
	1	ET	4	Use scientific notation to represent mathematical quantities.					
	1	ET	5	Demonstrate the ability to represent a given quantity using the following prefixes: milli, micro, nano, pico, kilo, meg, giga, and tera.					
	1	ET	6	Match the following list of electrical terms to their proper definition: - Volt - Ampere - Ohm - Conductance - Resistance - Insulator - Resistor - Open - Short - Coulomb					
	1	ET	7	Match a list of fuses and circuit breakers to their					
	1	ET	8	Match wire samples to a list of their proper size					
	1	ET	9	List the factors that determine the current					
	1	ET	10	Determine the resistance values of color banded					
	1	ET	11	Demonstrate proficiency in the use of the					
	1	ET	12	Given a 10VDC supply and a 10K ohm resistor,					
	1	ET	13	Construct, and debug a series circuit containing 3					
	1	ET	14	Construct, and debug a parallel circuit containing					
	1	ET	15	Given a circuit containing (3) series resistors and					
	1	ET	16	Match standardized symbols used in schematic					
	1	ET	17	Using schematic diagrams construct and debug various electrical resistive circuits.					
	1	ET	18	Construct an electromagnet using a battery, a					
	1	ET	19	Demonstrate the induction method of generating					
	1	ET	20	Given a graphical representation of an AC sine					
	1	ET	21	Setup the scope to take measurements from a					
	1	ET	22	Construct, and debug a circuit with 2 resistors in					
	1	ET	23	Using the Reactance Formula, determine the					
	1	ET	24	Using the Reactance Formula, determine the Capacitive Reactance of a Capacitor in an electrical AC circuit.					
	1	ET	25	Construct, and debug series and parallel Inductive AC circuits. Use an oscilloscope to measure and analyze the waveforms. Calculate all voltages, currents, powers, and phase angles for the circuit. Verify all voltage, current and phase angle calculations through the proper use of meters and scopes.					

	1	ET	26	Construct, and debug series and parallel Capacitive AC circuits. Use an oscilloscope to measure and analyze the waveforms. Calculate all voltages, currents, powers and phase angles for the circuit. Verify all voltage, current and phase angle calculations through the proper use of meters and scopes.						
	1	ET	27	Given values of inductors and resistors, calculate the LR time constant. Construct an inductive/resistive electrical circuit and verify results.						
	1	ET	28	Given values of capacitors and resistors, calculate the RC time constant. Construct a capacitive/resistive electrical circuit and verify results.						
	1	ET	29	Construct and debug a series/parallel electrical circuit. Apply Thevenin's theorem to simplify the circuit for analysis. Verify the results through practical substitution and measurement.						
	1	ET	30	Construct and debug series/parallel Inductive/Capacitive/Resistive AC circuits. Use an oscilloscope to measure and analyze the sinusoidal waveforms, calculate and then measure the voltage and current values of the sine waves. Measure the phase angle between the applied voltage and the total current.						
	1	ET	31	Use a continuity checker and an ohmmeter to verify the normally open and normally closed set of contacts on a switch.						
	1	ET	32	Using live electrical circuits, make voltage measurements with respect to ground.						
	1	ET	33	Use a voltmeter to determine the state of a switch (open or closed) in a circuit under power. Additionally, predict and verify with an ammeter whether current is flowing.						
	1	ET	34	Given a switch, a DC relay, DC power source, light bulb, and AC power source, determine the N/O contacts of the relay and construct a circuit where the DC switching circuit controls the AC power to the light bulb.						
	1	ET	35	Given a schematic, construct and debug an electrical circuit used for the purpose of troubleshooting. Demonstrate fault finding skills with the use of multi-meters to locate shorted and open circuits, induced by the Instructor.						
	1	ET	38	Match a list of terms for transformers to their proper description.						
	1	ET	39	Given primary voltage and current, use the known turns ratio to calculate the transformer's secondary terminal voltage and current.						
	1	ET	41	Match a list of the following tests performed on transformers to their proper description: - Polarity test - Insulation resistance test - Excitation and Power factor test - Impedance measurement - Winding resistance and short circuit test - Thermal test - Tap change - Frequency response - Loading, off loading						

Additions: Please add any additional objectives that we may have overlooked.

SAFETY DISCLAIMER:

M-SAMC educational resources are in no way meant to be a substitute for occupational safety and health standards. No guarantee is made to resource thoroughness, statutory or regulatory compliance, and related media may depict situations that are not in compliance with OSHA and other safety requirements. It is the responsibility of educators/employers and their students/employees, or anybody using our resources, to comply fully with all pertinent OSHA, and any other, rules and regulations in any jurisdiction in which they learn/work. M-SAMC will not be liable for any damages or other claims and demands arising out of the use of these educational resources. By using these resources, the user releases the Multi-State Advanced Manufacturing Consortium and participating educational institutions and their respective Boards, individual trustees, employees, contractors, and sub-contractors from any liability for injuries resulting from the use of the educational resources.

DOL DISCLAIMER:

This product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

RELEVANCY REMINDER:

M-SAMC resources reflect a shared understanding of grant partners at the time of development. In keeping with our industry and college partner requirements, our products are continuously improved. Updated versions of our work can be found here: http://www.msamc.org/resources.html.