

**KELLOGG COMMUNITY COLLEGE**  
**INDUSTRIAL ELECTRICITY AND ELECTRONICS**  
**COURSE OPTIONS**

**FALL 2023**

Certificate: 30 credits

Associate in Applied Science: 60 credits (combination of industrial electricity/electronics, technical electives, and general education credit requirements)

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Module Subject Code and Number	Module Title	Credit	Contact Hours	Lab Fees	Tuition	Total Cost
<input type="checkbox"/> INEL C910-6250	ELECTRIC ELECTRONICS ORIENTAT The orientation must be completed at the BACC in Coldwater prior to registration. Please call 517-279-5753 to verify available orientation times.		2	0.00	0.00	0.00
<b>UNIT 05 ELECTRICAL SAFETY</b>						
<input type="checkbox"/> INEL 05010-6250	ELECTRICAL SAFETY	0.17	4	3.00	45.82	48.82
<b>UNIT TOTAL</b>		<b>0.17</b>	<b>4</b>	<b>3.00</b>	<b>45.82</b>	<b>48.82</b>
<b>UNIT 10 MATHEMATICS FOR ELECTRICIANS</b>						
<input type="checkbox"/> INEL 10010-6250	ELECTRICAL MATH 1	0.08	2	13.00	21.56	34.56
<input type="checkbox"/> INEL 10020-6250	ELECTRICAL MATH 2	0.25	6	3.00	67.38	70.38
<input type="checkbox"/> INEL 10030-6250	ELECTRICAL MATH 3	0.25	6	3.00	67.38	70.38
<b>UNIT TOTAL</b>		<b>0.58</b>	<b>14</b>	<b>19.00</b>	<b>156.32</b>	<b>175.32</b>
<b>UNIT 15 ELECTRICAL THEORY</b>						
<input type="checkbox"/> INEL 15010-6250	ELECTRICAL THEORY	0.25	6	23.00	67.38	90.38
<input type="checkbox"/> INEL 15020-6250	STATIC ELECTRICITY	0.25	6	23.00	67.38	90.38
<input type="checkbox"/> INEL 15030-6250	CALCULATORS AND ELECTRONICS	0.25	6	23.00	67.38	90.38
<input type="checkbox"/> INEL 15040-6250	DEVICES AND SYMBOLS	0.25	6	23.00	67.38	90.38
<input type="checkbox"/> INEL 15050-6250	MULTIMETER	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 15060-6250	OHM'S LAW	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 15070-6250	SERIES CIRCUITS	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 15080-6250	PARALLEL CIRCUITS	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 15090-6250	COMBINATION CIRCUITS	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 15100-6250	MAGNETISM	0.25	6	23.00	67.38	90.38
<input type="checkbox"/> INEL 15110-6250	ALTERNATING CURRENT	0.25	6	23.00	67.38	90.38
<input type="checkbox"/> INEL 15120-6250	OSCILLOSCOPE	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 15130-6250	INDUCTANCE	0.42	10	23.00	113.19	136.19
<input type="checkbox"/> INEL 15140-6250	CAPACITANCE	0.42	10	23.00	113.19	136.19
<input type="checkbox"/> INEL 15150-6250	RLC CIRCUITS	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 15160-6250	CONDUCTION	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 15170-6250	THEORY OVERVIEW	0.21	5	23.00	56.60	79.60
<b>UNIT TOTAL</b>		<b>5.19</b>	<b>125</b>	<b>391.00</b>	<b>1,398.78</b>	<b>1,789.78</b>
<b>UNIT 20 ELECTRICAL MOTORCONTROLS 1</b>						
<input type="checkbox"/> INEL 20010-6250	ELECTRICAL MOTOR CONTROLS	0.42	10	23.00	113.19	136.19
<input type="checkbox"/> INEL 20020-6250	MANUAL MOTOR CONTROLS	0.50	12	23.00	134.75	157.75
<input type="checkbox"/> INEL 20030-6250	CONTROL TRANSFORMERS	0.42	10	23.00	113.19	136.19
<input type="checkbox"/> INEL 20040-6250	CONTROL LADDER LOGIC	0.67	16	23.00	180.57	203.57
<input type="checkbox"/> INEL 20050-6250	CONTROL RELAYS MOTOR STARTERS	0.50	12	23.00	134.75	157.75
<input type="checkbox"/> INEL 20060-6250	INTRODUCTION TROUBLESHOOTING	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 20070-6250	SYSTEMS TROUBLESHOOTING	0.42	10	23.00	113.19	136.19
<input type="checkbox"/> INEL 20080-6250	AUTOMATIC INPUT DEVICES	0.42	10	23.00	113.19	136.19
<input type="checkbox"/> INEL 20090-6250	ELECTRONIC SENSORS	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 20100-6250	BASIC TIMER CONTROL	0.33	8	23.00	88.94	111.94
<input type="checkbox"/> INEL 20110-6250	TIMERS AND COUNTERS	0.25	6	23.00	67.38	90.38
<b>UNIT TOTAL</b>		<b>4.59</b>	<b>110</b>	<b>253.00</b>	<b>1,237.03</b>	<b>1,490.03</b>
<b>UNIT 35 NATIONAL ELECTRICAL CODE (NEC)</b>						
<input type="checkbox"/> INEL 35010-6250	GENERAL WIRING FUNDAMENTALS	0.25	6	17.00	67.38	84.38
<input type="checkbox"/> INEL 35020-6250	WIRE RACEWAY AND BOX SIZING	0.33	8	17.00	88.94	105.94

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<b>UNIT 35 NATIONAL ELECTRICAL CODE (NEC) (CONTINUED)</b>						
<input type="checkbox"/> INEL 35030-6250	BRANCH CIRCUITS	0.33	8	17.00	88.94	105.94
<input type="checkbox"/> INEL 35040-6250	SERVICE FEEDER CALCULATIONS	0.25	6	17.00	67.38	84.38
<input type="checkbox"/> INEL 35050-6250	GROUNDING AND BONDING	0.33	8	17.00	88.94	105.94
<input type="checkbox"/> INEL 35060-6250	OVERCURRENT PROTECTION	0.33	8	17.00	88.94	105.94
<input type="checkbox"/> INEL 35070-6250	MOTOR CIRCUIT WIRING	0.25	6	17.00	67.38	84.38
<input type="checkbox"/> INEL 35080-6250	TRANSFORMERS	0.25	6	17.00	67.38	84.38
<input type="checkbox"/> INEL 35090-6250	GENERAL HAZARDOUS LOCATIONS	0.25	6	17.00	67.38	84.38
<input type="checkbox"/> INEL 35100-6250	HEALTH CARE FACILITIES	0.25	6	17.00	67.38	84.38
<input type="checkbox"/> INEL 35110-6250	EMERGENCY POWER SYSTEMS	0.33	8	17.00	88.94	105.94
<input type="checkbox"/> INEL 35120-6250	INDUSTRIAL APPLICATIONS	0.33	8	17.00	88.94	105.94
<input type="checkbox"/> INEL 35130-6250	SPECIAL APPLICATION WIRING	0.25	6	17.00	67.38	84.38
<input type="checkbox"/> INEL 35140-6250	NEC REVIEW	0.17	4	17.00	45.82	62.82
<b>UNIT TOTAL</b>		<b>3.90</b>	<b>94</b>	<b>238.00</b>	<b>1,051.12</b>	<b>1,289.12</b>
<b>UNIT 40 POWER DISTRIBUTION SYSTEMS</b>						
<input type="checkbox"/> INEL 40010-6250	POWER GENERATION DISTRIBUTION	0.33	8	39.00	88.94	127.94
<input type="checkbox"/> INEL 40020-6250	ELECTRICAL WIRING TECHNIQUES	0.33	8	39.00	88.94	127.94
<input type="checkbox"/> INEL 40030-6250	WIRING SYSTEM INSTALLATION	0.42	10	39.00	113.19	152.19
<input type="checkbox"/> INEL 40040-6250	INTRODUCTION TO RACEWAYS	0.42	10	39.00	113.19	152.19
<input type="checkbox"/> INEL 40050-6250	BASIC CONDUIT BENDING	0.25	6	39.00	67.38	106.38
<input type="checkbox"/> INEL 40060-6250	ADVANCED RACEWAYS	0.25	6	39.00	67.38	106.38
<input type="checkbox"/> INEL 40070-6250	CONDUCTOR OVERCURRENT PROTECT	0.25	6	39.00	67.38	106.38
<input type="checkbox"/> INEL 40080-6250	CONDUIT SIZING WIRE PULLING	0.33	8	39.00	88.94	127.94
<b>UNIT TOTAL</b>		<b>2.58</b>	<b>62</b>	<b>312.00</b>	<b>695.34</b>	<b>1,007.34</b>
<b>UNIT 45 FACILITY MAINTENANCE</b>						
<input type="checkbox"/> INEL 45010-6250	PLANS AND SITE WORK	0.25	6	30.00	67.38	97.38
<input type="checkbox"/> INEL 45020-6250	INDUSTRIAL POWER SYSTEMS	0.42	10	30.00	113.19	143.19
<input type="checkbox"/> INEL 45030-6250	SIGNALING SYSTEMS	0.25	6	30.00	67.38	97.38
<input type="checkbox"/> INEL 45040-6250	MOTORS CONTROLLERS INSTALLATIO	0.33	8	30.00	88.94	118.94
<input type="checkbox"/> INEL 45050-6250	SPECIAL EQUIPMENT & HVAC	0.33	8	30.00	88.94	118.94
<input type="checkbox"/> INEL 45060-6250	INDUSTRIAL HAZARDOUS LOCATIONS	0.25	6	30.00	67.38	97.38
<input type="checkbox"/> INEL 45070-6250	SINGLE PHASE TRANSFORMERS	0.33	8	30.00	88.94	118.94
<input type="checkbox"/> INEL 45080-6250	3 PHASE TRANSFORMERS	0.50	12	30.00	134.75	164.75
<input type="checkbox"/> INEL 45090-6250	NEC TRANSFORMER REQUIREMENTS	0.25	6	30.00	67.38	97.38
<input type="checkbox"/> INEL 45100-6250	EMERGENCY ELECTRICAL SYSTEMS	0.25	6	30.00	67.38	97.38
<b>UNIT TOTAL</b>		<b>3.16</b>	<b>76</b>	<b>300.00</b>	<b>628.95</b>	<b>883.93</b>
<b>UNIT 55 INDUSTRIAL ELECTRONICS</b>						
<input type="checkbox"/> INEL 55010-6250	USING THE OSCILLOSCOPE	0.67	16	21.00	180.57	201.57
<input type="checkbox"/> INEL 55020-6250	METERS FOR ELECTRONICS	0.33	8	21.00	88.94	109.94
<input type="checkbox"/> INEL 55030-6250	ELECTRONIC SOLDERING	0.25	6	21.00	67.38	88.38
<input type="checkbox"/> INEL 55040-6250	SOLDERING PRINTED CIRCUIT BOAR	0.25	6	21.00	67.38	88.38
<input type="checkbox"/> INEL 55050-6250	DIODES	0.25	6	21.00	67.38	88.38
<input type="checkbox"/> INEL 55060-6250	POWER SUPPLIES	0.50	12	21.00	134.75	155.75
<input type="checkbox"/> INEL 55070-6250	PHOTO DEVICES	0.33	8	21.00	88.94	109.94
<input type="checkbox"/> INEL 55080-6250	SOLID STATE DEVICES	0.83	20	21.00	223.69	244.69
<input type="checkbox"/> INEL 55090-6250	ELECTRONIC TIMING	0.33	8	21.00	88.94	109.94
<input type="checkbox"/> INEL 55100-6250	AMPLIFIERS	0.83	20	21.00	223.69	244.69
<input type="checkbox"/> INEL 55110-6250	DIGITAL LOGIC FUNDAMENTALS	0.50	12	21.00	134.75	155.75
<input type="checkbox"/> INEL 55120-6250	DIGITAL LOGIC APPLICATIONS	0.42	10	21.00	113.19	134.19
<input type="checkbox"/> INEL 55130-6250	PROXIMITY SWITCHING	0.17	4	21.00	45.82	66.82
<input type="checkbox"/> INEL 55140-6250	PHOTOELECTRIC DEVICES	0.17	4	21.00	45.82	66.82

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<b>UNIT 55</b>		<b>INDUSTRIAL ELECTRONICS (CONTINUED)</b>				
<input type="checkbox"/> INEL 55150-6250	FIBER OPTIC FUNDAMENTALS	0.33	8	21.00	88.94	109.94
<input type="checkbox"/> INEL 55160-6250	FIBER OPTIC LAB	0.25	6	21.00	67.38	88.38
<b>UNIT TOTAL</b>		<b>6.41</b>	<b>154</b>	<b>336.00</b>	<b>1,727.56</b>	<b>2,063.56</b>
<b>TOTAL</b>		<b>26.58</b>	<b>639</b>	<b>1,852.00</b>	<b>6,940.92</b>	<b>8,792.92</b>

**FOR OFFICE USE ONLY**

Instructor Approval \_\_\_\_\_ Date \_\_\_\_\_

Total Credit \_\_\_\_\_ Total Contact \_\_\_\_\_ Total Cost \_\_\_\_\_