

KELLOGG COMMUNITY COLLEGE
INDUSTRIAL ELECTRICITY AND ELECTRONICS
COURSE OPTIONS

Certificate: 30 credits

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

All costs are subject to change without notice. Please call 269-965-4137 to verify.

Module Subject Code and Number	Module Title	Credit	Contact Hours
<input type="checkbox"/> INEL C910-7201	ELECTRIC ELECTRONICS ORIENTAT		2
The orientation must be completed at the RMTC in Battle Creek prior to registration. Please call 269.965.4137 to verify available orientation times.			
UNIT 05	ELECTRICAL SAFETY		
<input type="checkbox"/> INEL 05010-7201	ELECTRICAL SAFETY	0.17	4
UNIT TOTAL		0.17	4
UNIT 10	MATHEMATICS FOR ELECTRICIANS		
<input type="checkbox"/> INEL 10010-7201	ELECTRICAL MATH 1	0.08	2
<input type="checkbox"/> INEL 10020-7201	ELECTRICAL MATH 2	0.25	6
<input type="checkbox"/> INEL 10030-7201	ELECTRICAL MATH 3	0.25	6
UNIT TOTAL		0.58	14
UNIT 15	ELECTRICAL THEORY		
<input type="checkbox"/> INEL 15010-7201	ELECTRICAL THEORY	0.25	6
<input type="checkbox"/> INEL 15020-7201	STATIC ELECTRICITY	0.25	6
<input type="checkbox"/> INEL 15030-7201	CALCULATORS AND ELECTRONICS	0.25	6
<input type="checkbox"/> INEL 15040-7201	DEVICES AND SYMBOLS	0.25	6
<input type="checkbox"/> INEL 15050-7201	MULTIMETER	0.33	8
<input type="checkbox"/> INEL 15060-7201	OHM'S LAW	0.33	8
<input type="checkbox"/> INEL 15070-7201	SERIES CIRCUITS	0.33	8
<input type="checkbox"/> INEL 15080-7201	PARALLEL CIRCUITS	0.33	8
<input type="checkbox"/> INEL 15090-7201	COMBINATION CIRCUITS	0.33	8
<input type="checkbox"/> INEL 15100-7201	MAGNETISM	0.25	6
<input type="checkbox"/> INEL 15110-7201	ALTERNATING CURRENT	0.25	6
<input type="checkbox"/> INEL 15120-7201	OSCILLOSCOPE	0.33	8
<input type="checkbox"/> INEL 15130-7201	INDUCTANCE	0.42	10
<input type="checkbox"/> INEL 15140-7201	CAPACITANCE	0.42	10
<input type="checkbox"/> INEL 15150-7201	RLC CIRCUITS	0.33	8
<input type="checkbox"/> INEL 15160-7201	CONDUCTION	0.33	8
<input type="checkbox"/> INEL 15170-7201	THEORY OVERVIEW	0.21	5
UNIT TOTAL		5.19	125
UNIT 20	ELECTRICAL MOTOR CONTROLS 1		
<input type="checkbox"/> INEL 20010-7201	ELECTRICAL MOTOR CONTROLS	0.42	10
<input type="checkbox"/> INEL 20020-7201	MANUAL MOTOR CONTROLS	0.50	12
<input type="checkbox"/> INEL 20030-7201	CONTROL TRANSFORMERS	0.42	10
<input type="checkbox"/> INEL 20040-7201	CONTROL LADDER LOGIC	0.67	16
<input type="checkbox"/> INEL 20050-7201	CONTROL RELAYS MOTOR STARTERS	0.50	12
<input type="checkbox"/> INEL 20060-7201	INTRODUCTION TROUBLESHOOTING	0.33	8
<input type="checkbox"/> INEL 20070-7201	SYSTEMS TROUBLESHOOTING	0.42	10
<input type="checkbox"/> INEL 20080-7201	AUTOMATIC INPUT DEVICES	0.42	10
<input type="checkbox"/> INEL 20090-7201	ELECTRONIC SENSORS	0.33	8
<input type="checkbox"/> INEL 20100-7201	BASIC TIMER CONTROL	0.33	8

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<input type="checkbox"/> INEL 20110-7201	TIMERS AND COUNTERS	0.25	6
UNIT TOTAL		4.59	110
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UNIT 25	ELECTRICAL MOTOR CONTROLS 2		
<input type="checkbox"/> INEL 25010-7201	REVERSING MOTOR CONTROL	0.33	8
<input type="checkbox"/> INEL 25020-7201	BRAKING METHODS	0.42	10
<input type="checkbox"/> INEL 25030-7201	REDUCED VOLTAGE STARTING	0.33	8
<input type="checkbox"/> INEL 25040-7201	INTRO FREQUENCY DRIVES (AC)	0.33	8
<input type="checkbox"/> INEL 25050-7201	AC DRIVES SPEED TORQUE CNT	0.33	8
<input type="checkbox"/> INEL 25060-7201	AC DRIVES ACCEL AND DECEL	0.33	8
<input type="checkbox"/> INEL 25070-7201	AC DRIVES TROUBLESHOOTING	0.33	8
<input type="checkbox"/> INEL 25080-7201	SCR MOTOR CONTROL	0.42	10
UNIT TOTAL		2.82	68
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UNIT 30	ROTATING ELECTRIC MACHINES		
<input type="checkbox"/> INEL 30010-7201	DC SERIES MOTORS	0.25	6
<input type="checkbox"/> INEL 30020-7201	DC SHUNT AND COMPOUND MOTORS	0.33	8
<input type="checkbox"/> INEL 30030-7201	MOTOR SPEED AND TORQUE	0.33	8
<input type="checkbox"/> INEL 30040-7201	MOTOR PERFORMANCE	0.25	6
<input type="checkbox"/> INEL 30050-7201	SPLIT PHASE MOTORS	0.25	6
<input type="checkbox"/> INEL 30060-7201	CAPACITOR START MOTORS	0.25	6
<input type="checkbox"/> INEL 30070-7201	PERMANENT CAPACITOR MOTORS	0.25	6
<input type="checkbox"/> INEL 30080-7201	THREE PHASE MOTORS	0.33	8
UNIT TOTAL		2.24	54
<hr/>			
UNIT 35	NATIONAL ELECTRICAL CODE (NEC)		
<input type="checkbox"/> INEL 35010-7201	GENERAL WIRING FUNDAMENTALS	0.25	6
<input type="checkbox"/> INEL 35020-7201	WIRE RACEWAY AND BOX SIZING	0.33	8
<input type="checkbox"/> INEL 35030-7201	BRANCH CIRCUITS	0.33	8
<input type="checkbox"/> INEL 35040-7201	SERVICE FEEDER CALCULATIONS	0.25	6
<input type="checkbox"/> INEL 35050-7201	GROUNDING AND BONDING	0.33	8
<input type="checkbox"/> INEL 35060-7201	OVERCURRENT PROTECTION	0.33	8
<input type="checkbox"/> INEL 35070-7201	MOTOR CIRCUIT WIRING	0.25	6
<input type="checkbox"/> INEL 35080-7201	TRANSFORMERS	0.25	6
<input type="checkbox"/> INEL 35090-7201	GENERAL HAZARDOUS LOCATIONS	0.25	6
<input type="checkbox"/> INEL 35100-7201	HEALTH CARE FACILITIES	0.25	6
<input type="checkbox"/> INEL 35110-7201	EMERGENCY POWER SYSTEMS	0.33	8
<input type="checkbox"/> INEL 35120-7201	INDUSTRIAL APPLICATIONS	0.33	8
<input type="checkbox"/> INEL 35130-7201	SPECIAL APPLICATION WIRING	0.25	6
<input type="checkbox"/> INEL 35140-7201	NEC REVIEW	0.17	4
UNIT TOTAL		3.90	94
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UNIT 40	POWER DISTRIBUTION SYSTEMS		
<input type="checkbox"/> INEL 40010-7201	POWER GENERATION DISTRIBUTION	0.33	8
<input type="checkbox"/> INEL 40020-7201	ELECTRICAL WIRING TECHNIQUES	0.33	8
<input type="checkbox"/> INEL 40030-7201	WIRING SYSTEM INSTALLATION	0.42	10

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Module Subject Code and Number	Module Title	Credit	Contact Hours
<input type="checkbox"/> INEL 40040-7201	INTRODUCTION TO RACEWAYS	0.42	10
<input type="checkbox"/> INEL 40050-7201	BASIC CONDUIT BENDING	0.25	6
<input type="checkbox"/> INEL 40060-7201	ADVANCED RACEWAYS	0.25	6
<input type="checkbox"/> INEL 40070-7201	CONDUCTOR OVERCURRENT PROTECT	0.25	6
<input type="checkbox"/> INEL 40080-7201	CONDUIT SIZING WIRE PULLING	0.33	8
UNIT TOTAL		2.58	62
UNIT 45	FACILITY MAINTENANCE		
<input type="checkbox"/> INEL 45010-7201	PLANS AND SITE WORK	0.25	6
<input type="checkbox"/> INEL 45020-7201	INDUSTRIAL POWER SYSTEMS	0.42	10
<input type="checkbox"/> INEL 45030-7201	SIGNALING SYSTEMS	0.25	6
<input type="checkbox"/> INEL 45040-7201	MOTORS CONTROLLERS INSTALLATIO	0.33	8
<input type="checkbox"/> INEL 45050-7201	SPECIAL EQUIPMENT & HVAC	0.33	8
<input type="checkbox"/> INEL 45060-7201	INDUSTRIAL HAZARDOUS LOCATIONS	0.25	6
<input type="checkbox"/> INEL 45070-7201	SINGLE PHASE TRANSFORMERS	0.33	8
<input type="checkbox"/> INEL 45080-7201	3 PHASE TRANSFORMERS	0.50	12
<input type="checkbox"/> INEL 45090-7201	NEC TRANSFORMER REQUIREMENTS	0.25	6
<input type="checkbox"/> INEL 45100-7201	EMERGENCY ELECTRICAL SYSTEMS	0.25	6
<input type="checkbox"/> INEL 45110-7201	CLASS B FIRE ALARM SYSTEMS	0.33	8
<input type="checkbox"/> INEL 45115-7201	ADVANCED FIRE ALARM SYSTEMS	0.42	10
UNIT TOTAL		3.91	94
UNIT 50	ELECTRICAL CONTROL WIRING		
<input type="checkbox"/> INEL 50010-7201	ELECTRICAL CONTROL WIRING	0.42	10
<input type="checkbox"/> INEL 50020-7201	ELECTRICAL CONTROL SYSTEMS	1.00	24
UNIT TOTAL		1.42	34
UNIT 55	INDUSTRIAL ELECTRONICS		
<input type="checkbox"/> INEL 55010-7201	USING THE OSCILLOSCOPE	0.67	16
<input type="checkbox"/> INEL 55020-7201	METERS FOR ELECTRONICS	0.33	8
<input type="checkbox"/> INEL 55030-7201	ELECTRONIC SOLDERING	0.25	6
<input type="checkbox"/> INEL 55040-7201	SOLDERING PRINTED CIRCUIT BOAR	0.25	6
<input type="checkbox"/> INEL 55050-7201	DIODES	0.25	6
<input type="checkbox"/> INEL 55060-7201	POWER SUPPLIES	0.50	12
<input type="checkbox"/> INEL 55070-7201	PHOTO DEVICES	0.33	8
<input type="checkbox"/> INEL 55080-7201	SOLID STATE DEVICES	0.83	20
<input type="checkbox"/> INEL 55090-7201	ELECTRONIC TIMING	0.33	8
<input type="checkbox"/> INEL 55100-7201	AMPLIFIERS	0.83	20
<input type="checkbox"/> INEL 55110-7201	DIGITAL LOGIC FUNDAMENTALS	0.50	12
<input type="checkbox"/> INEL 55120-7201	DIGITAL LOGIC APPLICATIONS	0.42	10
<input type="checkbox"/> INEL 55130-7201	PROXIMITY SWITCHING	0.17	4
<input type="checkbox"/> INEL 55140-7201	PHOTOELECTRIC DEVICES	0.17	4
<input type="checkbox"/> INEL 55150-7201	FIBER OPTIC FUNDAMENTALS	0.33	8
<input type="checkbox"/> INEL 55160-7201	FIBER OPTIC LAB	0.25	6
UNIT TOTAL		6.41	154
UNIT 60	PROGRAM LOGIC CONTROLLERS 1		

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UNIT 67 SIEMENS S7-300 PLCS			
<input type="checkbox"/> INEL 67010-7201	SIEMENS 300 INTRO TO PLCS	0.50	12
<input type="checkbox"/> INEL 67020-7201	SIEMENS 300 BASIC PLC PROGRAM	0.50	12
<input type="checkbox"/> INEL 67030-7201	SIEMENS 300 PLC MOTOR CONTROL	0.50	12
<input type="checkbox"/> INEL 67040-7201	SIEMENS 300 IO INTERFACING	0.50	12
<input type="checkbox"/> INEL 67050-7201	SIEMENS 300 PLC TIMERS	0.50	12
<input type="checkbox"/> INEL 67060-7201	SIEMENS 300 PLC COUNTERS	0.50	12
UNIT TOTAL		3.00	72
UNIT 75 INTRODUCTION TO CONTROL LOGIX			
<input type="checkbox"/> INEL 75010-7201	INTRO TO COMPACT LOGIX PLCS	0.25	6
<input type="checkbox"/> INEL 75020-7201	CREATING RS LOGIX 5000 PROJEC	0.25	6
<input type="checkbox"/> INEL 75030-7201	ETHERNET COMMUNICATION PROTO	0.42	10
<input type="checkbox"/> INEL 75040-7201	CREATING RS LOGIX 5000 PROGRA	0.42	10
<input type="checkbox"/> INEL 75050-7201	TON TOF RTO COUNTER INSTRUCTI	0.42	10
<input type="checkbox"/> INEL 75060-7201	CU AND CD COUNTER INSTRUCTION	0.42	10
UNIT TOTAL		2.18	52
UNIT 76 ADVANCED PROGRAMMING FOR CONTROL LOGIX			
<input type="checkbox"/> INEL 76010-7201	INTRO TO PLC TROUBLESHOOTING	0.33	8
<input type="checkbox"/> INEL 76020-7201	PLC SYSTEMS TROUBLESHOOTING	0.33	8
<input type="checkbox"/> INEL 76030-7201	EVENT SEQUENCING	0.33	8
<input type="checkbox"/> INEL 76040-7201	APPLICATION DEVELOPMENT	0.50	12
<input type="checkbox"/> INEL 76050-7201	PROGRAM CONTROL INSTRUCTIONS	0.50	12
<input type="checkbox"/> INEL 76060-7201	MATH DATA MOVE INSTRUCTIONS	0.58	14
UNIT TOTAL		2.57	62
UNIT 70 PANEL VIEW			
<input type="checkbox"/> INEL 70010-7201	INTRODUCTION TO PANEL VIEW	0.17	4
<input type="checkbox"/> INEL 70020-7201	TERMINAL OVERVIEW	0.25	6
<input type="checkbox"/> INEL 70030-7201	WIRING AND SET UP	0.25	6
<input type="checkbox"/> INEL 70040-7201	TERMINAL CONFIGURATION	0.25	6
<input type="checkbox"/> INEL 70050-7201	TROUBLESHOOTING MAINTENANCE	0.25	6
<input type="checkbox"/> INEL 70060-7201	PROGRAMMING PANEL VIEW	0.83	20
<input type="checkbox"/> INEL 70070-7201	PANEL VIEW PLC APPLICATIONS	1.04	25
<input type="checkbox"/> INEL 70080-7201	PANEL VIEW PLC COMMUNICATION	0.21	5
UNIT TOTAL		3.25	78
UNIT 80 MACHINE SAFETY CONTROLS			
<input type="checkbox"/> INEL 80010-7201	INTRODUCTION MACHINE SAFETY	0.33	8
<input type="checkbox"/> INEL 80020-7201	LEVEL 1 MACHINE SAFETY	0.25	6
<input type="checkbox"/> INEL 80030-7201	LEVEL 2 MACHINE SAFETY	0.42	10
<input type="checkbox"/> INEL 80040-7201	LEVEL 3 MACHINE SAFETY	0.50	12

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<input type="checkbox"/> INEL 80050-7201	MACHINE SURVEY	0.33	8
UNIT TOTAL		1.83	44
UNIT 85	ROBOTICS PROGRAMMING AND MAINTENANCE		
<input type="checkbox"/> INEL 85010-7201	ROBOTICS INTRODUCTION	0.67	16
<input type="checkbox"/> INEL 85020-7201	PROGRAMMING ROBOTICS	1.29	31
<input type="checkbox"/> INEL 85030-7201	PROGRAMMING ROBOTICS FANUC	0.75	18
<input type="checkbox"/> INEL 85040-7201	PROGRAMMING ROBO OFFLINE FANUC	0.58	14
<input type="checkbox"/> INEL 85050-7201	PROGRAMMING ROBOTICS MOTOMAN	1.67	40
<input type="checkbox"/> INEL 85060-7201	PROG ROBOTICS OFFL MOTOMAN	1.00	24
<input type="checkbox"/> INEL 85070-7201	PROGRAMMING ROBOTICS DENSO	0.42	10
<input type="checkbox"/> INEL 85080-7201	PRGM ROBOTICS OFFLINE DENSO	0.83	20
<input type="checkbox"/> INEL 85090-7201	MAINT PM TROUBLSHOOT ROBOTIC	1.04	25
UNIT TOTAL		8.25	198
UNIT 95	MECHATRONICS		
<input type="checkbox"/> INEL 95010-7201	MECHATRONICS AUTOMATION OPER	0.21	5
<input type="checkbox"/> INEL 95020-7201	MECHATRONICS BASIC COMP ADJ	0.21	5
<input type="checkbox"/> INEL 95030-7201	MECHATRONICS PICK PLACE FEED	0.21	5
<input type="checkbox"/> INEL 95040-7201	MECHATRONICS GAUGING	0.21	5
<input type="checkbox"/> INEL 95050-7201	MECHATRONICS INDEXING	0.21	5
<input type="checkbox"/> INEL 95060-7201	MECHATRONICS SORTING QUEUING	0.21	5
<input type="checkbox"/> INEL 95070-7201	MECHATRONICS SERVO ROBOTIC	0.21	5
<input type="checkbox"/> INEL 95080-7201	MECHATRONICS TORQUEING	0.21	5
<input type="checkbox"/> INEL 95090-7201	MECHATRONICS PARTS STORAGE	0.21	5
<input type="checkbox"/> INEL 95095-7201	MECHATRONICS STATION PROGRAM	0.21	5
<input type="checkbox"/> INEL 95100-7201	MECHATRONICS MULTI STATION CN	0.21	5
UNIT TOTAL		2.31	55
TOTAL		54.89	1,321

ASSESSMENTS

<input type="checkbox"/> *INEL C201-7201	SACA C-201 CERTIFICATION	4
<input type="checkbox"/> *INEL C202-7201	SACA C-202 CERTIFICATION	4
<input type="checkbox"/> *INEL C204-7201	SACA C-204 CERTIFICATION	4
<input type="checkbox"/> *INEL C207-7201	SACA C-207 CERTIFICATION	4
<input type="checkbox"/> *INEL C208-7201	SACA C-208 CERTIFICATION	4

FOR OFFICE USE ONLY

Instructor Approval _____ Date _____

Total Credit _____ Total Contact _____ Total Cost _____