

2018-2019

SOUTHEAST  
COMMUNITY  
COLLEGE  
NEBRASKA

# ELECTRICAL & ELECTROMECHANICAL TECHNOLOGY

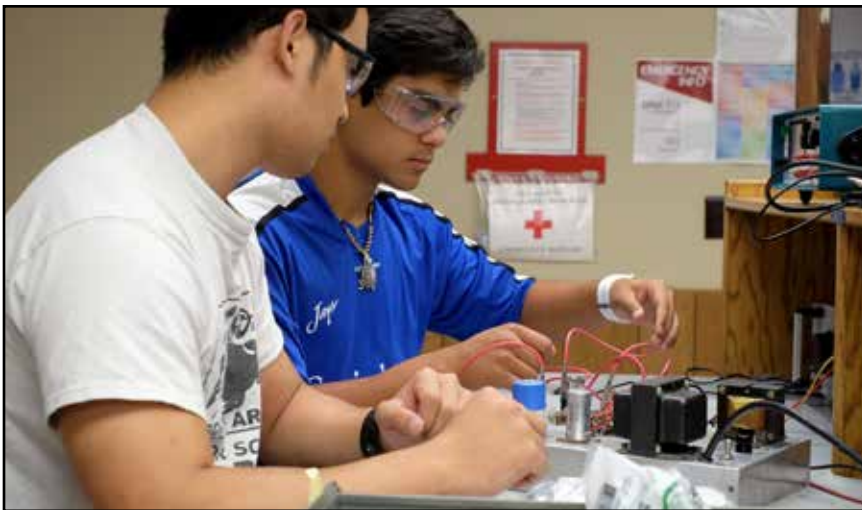
Associate of  
Applied Science  
Degree  
Diploma

MILFORD CAMPUS AND ONLINE

[www.southeast.edu/ElectricalElectromechanical](http://www.southeast.edu/ElectricalElectromechanical)



*Electrical and electromechanical technicians are in high demand, and SCC provides you with the tools to get your career on high voltage today! Electricians install, connect, test, and maintain electrical systems for residential, commercial and industrial systems, as well as maintain components for climate control, security and communications. Electromechanical technicians visualize, design, create, and repair the many devices that are used throughout the industrial-manufacturing world by combining their electrical and mechanical background. Skills such as welding, hydraulics and machining, along with their electrical capabilities, are used every day to keep industry running. Robotics and automated control systems are a large part of industry, and our students receive many hours of training in these areas. Electricians may install and maintain the electronic controls for machines in business and industry.*



### ELECTRICAL FOCUS

- Electrician
- Journeyman Electrician
- Maintenance Electrician
- Residential Electrician
- Industrial Electrician
- Commercial Electrician
- Master Electrician
- Electrical Contractor

### ELECTROMECHANICAL FOCUS

- Electromechanical Technician
- Maintenance Electrician
- Technical Maintenance Personnel
- Maintenance Mechanic
- Instrumentation and Control Technician
- Facilities Maintenance Electrician

### Graduate Earnings

Recent graduates report an average starting wage of \$21.10 per hour.

### For more information contact:

Ken Reinsch, Program Chair/Milford  
402-761-8258, 800-933-7223 ext. 8258  
[kreinsch@southeast.edu](mailto:kreinsch@southeast.edu)

or the College Admissions Office  
Milford 402-761-8243, 800-933-7223 ext. 8243

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### What Employers Say About SCC Graduates

*"Working closely with the Electrical and Electromechanical instructors has always been a positive and rewarding experience. SCC uses the same methodology and is in 'sync' with our own in-house training department. Creating an environment where a student/employee can learn is one thing, but to build an atmosphere where they are tested, challenged and encouraged to think on their own creates a higher level of proficiency and troubleshooting ability. These attributes are not only key to the technical trade, but valuable tools that can be used in all aspects of life. 3M has had great success with SCC students; being able to hit the ground running, demonstrating disciplined expertise, arriving to work on time, and providing a can-do attitude day-in and day-out. All of this is a reflection of the dedication and efforts that go into the Milford Campus."*

Marvin Wiese, Plant Engineering GS, Valley, Neb.

## Electrical & Electromechanical Technology

### General Education Requirements (AAS)

See the General Education pages online for a complete list.

Oral Communications	4.5
Written Communications	4.5
Analytical, Quantitative, and Scientific Reasoning MATH1050 or higher (Recommended)	4.5
Critical Thinking & Problem Solving PHYS1017 or PHYS1150 or PHYS1410 (Recommended)	4.5
Career and Life Skills BSAD1010 (Recommended)	4.5
ECON1200 (Recommended)	4.5
<b>Total</b>	<b>27.0</b>

### EL/EM Technology Core

Course #	Course Title	Credit hrs.
ELEC1132	DC Principles I	4.5
ELCE1133	DC Principles II	4.5
ELEC1232	AC Principles I	4.5
ELEC1233	AC Principles II	4.5
ELEC1344	Motor Controls	1.5
ELEC1464	Transformers, Three-Phase Systems	4.5
ELEC1474	Predictive Maintenance Principles	3.0
ELEC2534	Programmable Logic Controllers I	4.5
ELEC2546	Electrical Machine Controls	3.0
ELEC2555	Industrial Communications & Alarm Systems	3.0
ELEC2564	Industrial Electronic Controls	7.5
ELEC2614	Robotics and Integrated Automation	8.0
ELEC2624	Programmable Logic Controllers II	9.0
<b>Total</b>		<b>62.0</b>

### Electrical Focus

Course #	Course Title	Credit hrs.
ELEC1336	CAD & Electrical Estimating	2.5
ELEC1366	Residential & Commercial Wiring I	7.5
ELEC1367	Residential & Commercial Wiring II	7.5
ELEC1496	Industrial Wiring I	5.5
ELEC1497	Industrial Wiring II	5.5
<b>Total</b>		<b>28.5</b>

### Electromechanical Focus

Course #	Course Title	Credit hrs.
ELEC1337	Sketching & CAD	3.0
ELEC1356	Fluid Power	6.0
ELEC1436	Power Transmission & Lubricants	3.0
ELEC1446	Industrial Machines & Mechanical Systems	6.0
MACH1121	Manufacturing Processes	3.5
MACH1131	Manufacturing Processes II for Electromechanical	3.0
WELD1191	GMAW and SMAW Industrial	3.0
<b>Total</b>		<b>27.5</b>

### Construction Electrician Diploma

Course #	Course Title	Credit hrs.
ELEC1132	DC Principles I	4.5
ELEC1133	DC Principles II	4.5
ELEC1232	AC Principles I	4.5
ELEC1233	AC Principles II	4.5
ELEC1336	CAD & Electrical Estimating	2.5
ELEC1344	Motor Controls	1.5
ELEC1366	Residential & Commercial Wiring I	7.5
ELEC1367	Residential & Commercial Wiring II	7.5
ELEC1464	Transformers, Three Phase Systems	4.5
ELEC1474	Predictive Maintenance Principles	3.0
ELEC1496	Industrial Wiring I	5.5
ELEC1497	Industrial Wiring II	5.5
<b>Total</b>		<b>55.5</b>

### General Education Requirements (Diploma)

Career and Life Skills BSAD1010	4.5
Analytical, Quantitative, and Scientific Reasoning MATH1050 or higher	4.5
<b>Total</b>	<b>9.0</b>

## Electrician Construction - IBEW Option

The curriculum is provided with the cooperation of SCC and Nebraska representatives of the International Brotherhood of Electrical Workers, IBEW-Local 265. Applicants must meet the stated SCC and IBEW-Local 265 entrance requirements to be accepted into the program.

The curriculum is normally delivered over a five-year period. Instruction will be delivered at the IBEW training facility.

### For more information contact:

Ken Reinsch, Electrical & Electromechanical Technology; Program Chair  
402-761-8258, 800-933-7223 ext. 8258,  
kreinsch@southeast.edu

Roy Lamb, Director of Training  
Joint Apprenticeship and Training Committee (JATC); 402-423-4519

or the College Admissions Office  
Milford 402-761-8243, 800-933-7223 ext. 8243

### General Education Requirements (AAS)

See the General Education pages for a complete list.

Oral Communication	4.5
Written Communication	4.5
Plus three classes from the four areas below; no two classes from the same area.	
Critical Thinking & Problem Solving	
Global Awareness and Citizenship	
Analytical, Quantitative, and Scientific Reasoning	
Career and Life Skills	13.5
<b>Total</b>	<b>22.5 hours</b>

### IBEW Training Center

For members of the International Brotherhood of Electrical Workers (IBEW - Local 265)

Classes are held at the IBEW Training Center, 6200 S. 14th St. in Lincoln. Prepares students for a career in the commercial and residential electrical construction industry.

### Combination Theory/Laboratory classes one per year, as follows:

Course #	Course title	Credit hrs.
ELET1714	DC Circuits and Conduit Bending	12.5
ELET1719	AC/DC Circuits and Blueprint Reading	12.5
ELET1724	AC Theory, Fire Alarm & Grounding and Bonding	12.5
ELET1729	Logic Circuits and Electrical Motors	12.5
ELET1734	Process Controllers and Special Electrical Circuits	12.5
<b>Total</b>		<b>62.5 hours</b>

### On-the-job Training:

One course of 200 clock hours per year. Skills checklist, as shown on syllabi, verified to SCC by IBEW. Supervision by IBEW members. Location of the OJT site varies with the demands of the Electrical industry.

Course #	Course title	Credit hrs.
ELET1715	Electrical Wiring Applications I	5.0
ELET1720	Electrical Wiring Applications II	5.0
ELET1725	Electrical Wiring Applications III	5.0
ELET1730	Electrical Wiring Applications IV	5.0
ELET1735	Electrical Wiring Applications V	5.0
<b>Total</b>		<b>25.0 hours</b>

2018-2019 Quarter-by-quarter curriculum



<b>First Quarter</b>		
ELEC1132	DC Principles I	4.5
ELEC1133	DC Principles II	4.5
ENGL1110	Business Communications	4.5
MATH1050	Thinking Mathematically (recommended)	4.5
BSAD1010	Microsoft Applications I (recommended)	4.5
		22.5



<b>Second Quarter</b>		
ELEC1232	AC Principles I	4.5
ELEC1233	AC Principles II	4.5
PHYS1017	Technical Physics	4.5
SPCH1110	Public Speaking (recommended)	4.5
ECON1200	Personal Finance (recommended)	4.5
		22.5

<b>ELECTRICAL FOCUS</b>		
<b>Third Quarter</b>		
ELEC1366*	Residential & Commercial Wiring I	7.5
ELEC1367*	Residential & Commercial Wiring II	7.5
ELEC1336*	CAD & Electrical Estimating	2.5
ELEC1344	Motor Controls	1.5
		19.0

<b>ELECTROMECHANICAL FOCUS</b>		
<b>Third Quarter</b>		
ELEC1337**	Sketching & CAD	3.0
WELD1191**	Welding for Electrical & Electromechanical	3.0
ELEC1356**	Fluid Power	6.0
MACH1121**	Manufacturing Processes	3.5
MACH1131**	Manufacturing Processes II for Electromechanical	3.0
		18.5

<b>Fourth Quarter</b>		
ELEC1474	Predictive Maintenance Principles	3.0
ELEC1464	Transformers, Three-Phase Systems	4.5
ELEC1496*	Industrial Wiring I	5.5
ELEC1497*	Industrial Wiring II	5.5
		18.5

<b>Fourth Quarter</b>		
ELEC1474	Predictive Maintenance Principles	3.0
ELEC1464	Transformers, Three-Phase Systems	4.5
ELEC1446**	Industrial Machines & Mechanical Systems	6.0
ELEC1344	Motor Controls	1.5
ELEC1436**	Power Transmissions & Lubricants	3.0
		18.0

Construction Electrician Diploma option offered at this point.



<b>Fifth Quarter</b>		
ELEC2534	Programmable Logic Controllers I	4.5
ELEC2564	Industrial Electronic Controls	7.5
ELEC2546	Electrical Machine Controls	3.0
ELEC2555	Industrial Communications & Alarm Systems	3.0
		18.0



<b>Sixth Quarter</b>		
ELEC2624	Programmable Logic Controllers II	9.0
ELEC2614	Robotics and Integrated Automation	8.0
		17.0

\* Additional courses an electrical graduate would need to complete to obtain a focus in Electrical Systems. (6 months -- 34 Quarter Credits)

\*\* Additional courses an electromechanical graduate would need to complete to obtain a focus in Electromechanical Systems (6 months--34.5 Quarter Credits)

### Estimated Expenses

Nebraska Resident tuition/fee rate is \$69.50 per credit hour. Out-of-state tuition/fee rate is \$83.50 per credit hour. Graduation fee is \$25.

Housing is available at Beatrice and Milford campuses only. Tuition, books and fees are dependent upon classes taken each quarter.

Students should plan a budget that includes room, meals, clothing, laundry, medical care, recreation and entertainment, transportation, insurance, etc.

#### FIRST QUARTER

Tuition And Fees	\$1,564
Books	710
Supplies	66
<b>Total</b>	<b>\$2,340</b>

#### SECOND QUARTER

Tuition And Fees	\$1,564
Books	390
<b>Total</b>	<b>\$1,954</b>

#### ELT THIRD QUARTER

Tuition And Fees	\$1,286
Books	500
Tools	350
<b>Total</b>	<b>\$2,136</b>

#### ELM THIRD QUARTER

Tuition And Fees	\$1,286
Books	225
Tools	80
Supplies	120
<b>Total</b>	<b>\$1,711</b>

#### ELT FOURTH QUARTER

Tuition And Fees	\$1,251
Books	140
<b>Total</b>	<b>\$1,391</b>

#### ELM FOURTH QUARTER

Tuition And Fees	\$1,251
Books	200
Tools	400
<b>Total</b>	<b>\$1,851</b>

#### FIFTH QUARTER

Tuition And Fees	\$1,251
Books	360
Supplies	16
<b>Total</b>	<b>\$1,627</b>

#### SIXTH QUARTER

Tuition And Fees	\$1,182
<b>Total</b>	<b>\$1,182</b>

<b>Program total ELT:</b>	<b>\$10,630</b>
<b>Program total ELM:</b>	<b>\$10,665</b>

Electrician Construction – IBEW Option  
The IBEW/NECA apprenticeship fund pays the tuition and student fees.

#### 1ST YEAR APPRENTICE

Books	\$ 300
Tools	450
<b>Total</b>	<b>\$ 750</b>

#### 2ND YEAR APPRENTICE

Books	\$ 400
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#### 3RD YEAR APPRENTICE

Books	\$ 500
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#### 4TH YEAR APPRENTICE

Books	\$ 600
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#### 5TH YEAR APPRENTICE

Books	\$ 700
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No costs are shown for tools in the 2nd through 5th years, but it should be noted that the apprentice might need to replace tools from time to time due to normal wear and tear.

## Basic Tools and Supplies Required for Program

### Required Tools/Supplies to Enter 1st Quarter

- Safety Glasses (must meet Z87 specs.)
- Large 3-Ring Binder (2)
- Graph Paper Pad 10 x 10 (10 sq./in.)
- Electronic Calculator (specifications to be provided in class)
- Flash Drive
- Set of Colored Pencils

### Supplies for 2nd Quarter

- \* Pad of Oscillogram Paper

### Tools/Supplies for 3rd & 4th Quarters

See the bulleted list for each focus area.

### Supplies for 5th Quarter

- \*1 Pad of Oscillogram Paper
- \*1 Circuit Breadboard

\*=May be purchased at the Campus Store.



### Electrical - Tools/Supplies for 3rd & 4th Quarters

- Tool Pouch (equipped with large utility pocket, small utility pocket, two plier pockets, two screwdriver pockets, a chain tape thong and a knife snap)
- Tool Belt (heavy duty leather or fully adjustable poly web)
- Aluminum torpedo level with magnetized strip on bottom
- Steel locking tape (3/4" by 25 feet minimum)
- Electricians pocket knife
- Hammer (heavy duty curved claw)
- 10" adjustable jaw wrench
- 10" pump plier (with plastic dip handles)
- 6 3/4" diagonal cutters (with plastic dip handles)
- 6" long nose pliers with cutters (with plastic dip handles)
- 9 1/4" high leverage lineman plier (with plastic dip handles)
- Phillip screwdriver size #2 with 4" shank
- Standard screwdriver 3/16" blade with 6" shank
- Standard screwdriver 5/16" blade with 6" shank
- Shoes (hard-sole)
- \*Architecture Ruler
- Multimeter (see Program Chairperson for details)
- Hard Hat
- 3mm x 100mm Screwdriver
- Wire Strippers w/Terminal Crimp Jaw

### Electromechanical - Supplies for 3rd Quarter

- Some type of leather shoes required. No canvas. Must be high tops.
- \*Oxy-Fuel Face Shield
- \*Arc Welding Helmet (No. 10 Lens)
- \*Leather Gauntlet Welding Gloves
- \*Pliers or Locking Pliers (Vice-Grips)
- \*Chipping Hammer and Wire Brush
- \*Wire Cutter Pliers, Side Cutters
- \*Safety Glasses With Side Shields

### Electromechanical - Tools for 4th Quarter

- Portable Tool Chest
- 1/2" or 3/8" Socket Set (1/4" through 3/4")
- 10" Ratchet For The Above Socket Set
- 5" Extension For The Above Socket Set
- 10" and 8" Adjustable Wrench
- 7 Piece Combination Wrench Set
- Wire Strippers With Terminal Crimp Jaw
- Standard Tip Screwdriver -1/4" Blade With 4" Shank
- Standard Tip Screwdriver - 5/16" Blade With 6" Shank
- Phillips Screwdriver - Size 1
- Phillips Screwdriver - Size 2
- Locking Tape (1/2" by 12 feet)
- Hex Key Set (5/64" through 3/8")
- 6 3/4" Slip Joint Pliers
- 7 3/4" Curved Diagonal Cut Pliers
- 6" long nose pliers
- 10" locking pliers (straight or curved jaw)
- 1 1/2 lb. standard deadblow hammer
- 16 oz. ball peen hammer
- 5 piece punch set (1/16" through 5/32")
- Multimeter (see Program Chairperson for details)
- 3mm x 100mm Screwdriver
- Utility Knife