

## Career and Technical Education

### Certificate of Achievement – Electrical Systems Technology

#### Professional Skills and Career Paths

Open Pit Electrician, Underground Mine Electrician,  
Manufacturing Electrician, Service Electrician, I&E  
Industrial Electrical

#### Student Learning Outcomes

The Electrical Systems Technology Certificate of Achievement Program is designed for students who desire employment in electrical work and the opportunity to develop their electrical skills through on-the-job training. Electrical courses are on a non-traditional schedule. Because of the intensity of the program, students will be very close to AAS degree completion and are encouraged to pursue the degree.

This program prepares students to work in diverse industries including mining, manufacturing, power plants, power distribution, construction, sales, machine control, water resource management, and gaming. Graduates of the Electrical Systems Technology Certificate program will have the knowledge to:

- Analyze and interpret graphical information found on schematics, blueprints, and diagrams.
- Identify, use, and maintain motor and computer-based control systems.
- Have a firm understanding of theories that apply to the electrical trade.
- Interpret and properly apply the National Electrical Code to electrical installations.
- Demonstrate the proper use of tools used in the electrical field/industry.
- Design, construct, and troubleshoot various electrical systems used in commercial and industrial settings.
- Perform safely in the work environment, meeting and obeying all workplace safety requirements.

**Formal admission to this program is required. Refer to page 86 for an outline of admission standards.**

<b>General Education Requirements</b>	<b>Credits</b>
English/Communications. Determined	
by placement testing .....	3
ENG 100, 101, 103, or 107	
Computation — Any course with a MATH prefix .....	3
Human Relations	
BUS 110 (recommended) .....	1-3

<b>Program Requirements</b>		<b>Credits</b>
ELM 112	Electrical Theory, DC.....	3.5
ELM 120	Low Voltage Systems.....	3
ELM 121	Circuit Design .....	2
ELM 122	AC Theory .....	4
ELM 123	Solid State .....	2
ELM 124	DC Generators, Motors, and Controls ...	2
ELM 125	AC Motors and Alternators.....	2
ELM 126	Motor Maintenance .....	2
ELM 127	Introduction to AC Controls .....	2.5
ELM 128	Transformers and Industrial Lighting ...	4
ELM 131	National Electric Code .....	2.5
ELM 132	Digital Concepts .....	2
ELM 133	Advanced AC Controls.....	4
ELM 134	Introduction to Programmable Logic Controller's .....	2.5
ELM 135	National Electric Code 430 .....	1
ELM 136	Programmable Controller's Applications .....	2.5
ELM 141	Blueprint Reading .....	2
ELM 142	Raceways.....	2.5
ELM 143	Wiring Techniques.....	3

**SUGGESTED COURSE SEQUENCE  
Certificate of Achievement—  
Electrical Systems Technology**

<b>FALL—1st Semester</b>		<b>Credits</b>
ELM	112	3.5
ELM	120	3
ELM	121	2
ELM	122	4
ELM	124	2
ELM	128	4
ELM	142	2.5
ELM	141	2
ENGLISH*		3
COMPUTATION*		3
<b>TOTAL</b>		<b>29</b>

<b>SPRING—2nd Semester</b>		<b>Credits</b>
ELM	123	2
ELM	125	2
ELM	126	2
ELM	127	2.5
ELM	131	2.5
ELM	132	2
ELM	133	4
ELM	134	2.5
ELM	135	1
ELM	136	2.5
ELM	143	3
HUMAN RELATIONS*		1-3
<b>TOTAL</b>		<b>27-29</b>

**Refer to page 85. Minimum Credits: 56**

**\*Choose with advisor.**

**Employer Sponsored Pathway  
Certificate of Achievement —  
Electrical Systems Technology**

- Students interested in this program must have instructor approval to enroll.
- This program is available only to students who are working in an electrical field.
- Student’s employer must be willing to work with GBC faculty to provide practical lab experiences.
- Students receive electrical theory instruction through online delivery and lab instruction by attending classes on campus and through their employer.
- For more information, contact the CTE department at 775.753.2175.

**Substitute the following program requirements:**

ELM	101	Electrical Workforce Training I.....	7
ELM	102	Electrical Workforce Training II .....	7
ELM	103	Electrical Workforce Training III .....	7
ELM	104	Electrical Workforce Training IV .....	7
ELM	105	Electrical Workforce Training V .....	7
EIT	233	Introduction to Instrumentation .....	4

For Employer Sponsored Pathway for the Certificate of Achievement for Electrical Systems Technology see the next page.