

# ELECTRICAL CONSTRUCTION AND MAINTENANCE

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## DIPLOMA PROGRAM

Electricians install wiring and maintain electrical equipment such as generators and lighting systems. Industrial electricians inspect and service electronic control devices. Electricians involved in construction work follow blueprints and specifications in installing wiring. They may bend, fit, and fasten conduit inside partitions, walls, or other concealed areas. They also fasten small electrical boxes that house electrical devices such as lighting fixtures and switches. Electricians pull insulated wires or cables through the conduit to complete the circuits between outlets and switches. They connect the wiring to circuit breakers, transformers, and other components. They test circuit wiring for proper connections. Many electricians spend much of their time doing preventive maintenance.

This program prepares students for careers in residential and commercial electrical industries. Learning opportunities develop academic, technical, and professional knowledge and skills required for job acquisition, retention, and advancement. The program emphasizes a combination of theory and practical applications necessary for successful employment. Program graduates receive a diploma.

## ASSOCIATE DEGREE OPTION

Individuals who are graduates of, or eligible to graduate from, this diploma program and who meet general admission requirements for associate degree-level work may pursue an associate of applied science degree in Technical Studies by completing an additional 50 quarter credit hours of coursework. Interested students should see their advisors to obtain assistance in completing processes associated with readmission and/or change of major.

## CAREER OPPORTUNITIES

Graduates may be self-employed or qualify for positions as residential electricians, commercial electricians, industrial electricians, maintenance electricians, or maintenance trainees in government, public utility companies, and private industry.

## PROGRAM EXPENSES

The recent reauthorization of the Higher Education Act requires all colleges and universities to notify students and prospective students of all program costs for which they will be responsible. Students will be responsible for the following expenses:

- Quarterly tuition (\$45 per credit hour)
- Quarterly student activity fees (\$16)
- Quarterly registration fee (\$26)
- Quarterly accident insurance fee (\$4)
- Quarterly instructional and technology supply fee (\$35)
- Program supply fee (Approximately \$60 for the Electrical Construction and Maintenance program, \$30 for the Electrician's Assistant program, and \$40 for the Photovoltaic Systems Installation and Repair program)
- Textbooks (Approximately \$1,400 for the Electrical Construction and Maintenance program, \$750 for the Electrician's Assistant program, and \$550 for the Photovoltaic Systems Installation and Repair program)
- Tools (Approximately \$2,200 for the Electrical Construction and Maintenance program, \$400 for the Electrician's Assistant program, and \$800 for the Photovoltaic Systems Installation and Repair program)

The expenses are based on costs in effect at the time this catalog was published. Prices are subject to change.

## ADMISSION REQUIREMENTS

Applicants must submit the following information to the Admissions Office:

- a. Completed and signed application for admission and a \$20 nonrefundable application fee;
- b. Official high school or GED transcripts and/or official college transcripts from all colleges attended in the past (see *General Admission Requirements*); and
- c. Valid COMPASS, ASSET, SAT, or ACT test scores (see *ASSET and COMPASS Placement Tests*).

## ELECTRICAL CONSTRUCTION AND MAINTENANCE CURRICULUM OUTLINE

*Diploma Program (Major Code: W002)*

*Credit Required for Graduation: 72 quarter credit hours*

			<b>Credits</b>
<b>General Core</b>			<b>13</b>
EMP	1000	Interpersonal Relations and Professional Development	3
ENG	1010	Fundamentals of English I	5
MAT	1012	Foundations of Mathematics	5
<b>Technical Core</b>			<b>28</b>
ELT	106	Electrical Prints, Schematics, and Symbols	4
ELT	119	Electricity Principles II	4
ELT	120	Residential Wiring I	5
ELT	121	Residential Wiring II	6
IFC	100	Industrial Safety Procedures	2
IFC	101	Direct Current Circuits I	4
SCT	100	Introduction to Microcomputers	3
<b>Technical Major</b>			<b>28</b>
ELT	107	Commercial Wiring I	5
ELT	108	Commercial Wiring II	5
ELT	109	Commercial Wiring III	5
ELT	111	Single-Phase and Three-Phase Motors	5
ELT	112	Variable Speed and Low Voltage Controls	3
ELT	118	Electrical Controls	5
<b>Elective</b>			<b>3</b>

## ELECTRICIAN'S ASSISTANT CURRICULUM OUTLINE

*Technical Certificate of Credit (Major Code: ELA1)*

*Credit Required for Completion: 26 quarter credit hours*

			<b>Credits</b>
<b>Technical Certificate</b>			<b>26</b>
ELT	106	Electrical Prints, Schematics, and Symbols	4
ELT	120	Residential Wiring I	5
ELT	121	Residential Wiring II	6
IFC	100	Industrial Safety Procedures	2
IFC	101	Direct Current Circuits I	4
MAT	1012	Foundations of Mathematics	5

## PHOTOVOLTAIC SYSTEMS INSTALLATION AND REPAIR TECHNICIAN

*Technical Certificate of Credit (Major Code: PSI1)*

*Credit Required for Completion: 19 quarter credit hours*

			<b>Credits</b>
<b>Technical Certificate</b>			<b>19</b>
ELT	106	Electrical Prints, Schematics, and Symbols	4
ELT	119	Electricity Principles II	4
ELT	152	Photovoltaic Systems	5
IFC	100	Industrial Safety Procedures	2
IFC	101	Direct Current Circuits I	4

## EMPLOYABILITY SKILLS

Department Code: EMP

### EMP 1000

#### Interpersonal Relations and Professional Development (3-0-3)

*Banner Title: Interpersonal Relations*

Students study human relations and professional development in today's changing world in order to prepare themselves for living and working in a complex society. Topics include human relations skills, job acquisition skills and communications, job retention skills, job advancement skills, and professional image skills. *Prerequisite: Provisional admission*  
*Offered quarterly*

## ELECTRICAL CONSTRUCTION AND MAINTENANCE

Department Code: ELT

### ELT 106

#### Electrical Prints, Schematics, and Symbols (3-2-4)

*Banner Title: Prints/Schematics/Symbols*

This course introduces electrical symbols and their use in construction blueprints, electrical schematics, and diagrams. Topics include electrical symbols, component identification, print reading, and scales and measurements. *Prerequisites: IFC 100, IFC 101*  
*Offered twice per year*

### ELT 107

#### Commercial Wiring I (4-3-5)

*Banner Title: Commercial Wiring I*

Instructors introduce commercial wiring practices and procedures. Topics include National Electrical Code, commercial load calculations, and safety. *Prerequisites: ELT 106, ELT 121, IFC 100*  
*Offered twice per year*

### ELT 108

#### Commercial Wiring II (4-3-5)

*Banner Title: Commercial Wiring II*

Students study three-phase power systems, fundamentals of AC motor controls, and basic transformer connections. Topics include three-phase power systems, AC motor controls fundamentals, and transformer connections (single-phase and three-phase step down). *Corequisite: ELT 107*  
*Offered twice per year*

### ELT 109

#### Commercial Wiring III (4-3-5)

*Banner Title: Commercial Wiring III*

This course presents the theory and practical applications of conduit installa-

tion, system design concepts, and related safety requirements. Students must pay a \$10 supply fee when registering for this course.

*Corequisites: ELT 107, ELT 108*

*Offered twice per year*

### ELT 111

#### Single-Phase and Three-Phase Motors (4-3-5)

*Banner Title: Single-/Three-Phase Motors*

This course introduces the fundamental theories and applications of single-phase and three-phase motors. Topics include motor theory and operating principles, motor terminology, motor identification, NEMA standards, motor efficiencies, preventive maintenance, troubleshooting and failure analysis, and NEC requirements. Students must pay a \$10 supply fee when registering for this course.

*Prerequisites: ELT 119, IFC 100, IFC 101*

*Offered twice per year*

### ELT 112

#### Variable Speed and Low Voltage Controls (2-3-3)

*Banner Title: Vari Speed/Low Volt Controls*

This course introduces types of reduced voltage starting and applications and includes information on wye and delta motor connections, part wind, autotransformer, adjustable frequency drives, and other applications. Topics include types of reduced voltage starting, reduced voltage motor connections, and adjustable frequency drives. Students must pay a \$10 supply fee when registering for this course.

*Corequisite: ELT 111*

*Offered twice per year*

### ELT 118

#### Electrical Controls (3-5-5)

*Banner Title: Electrical Controls*

This course introduces line and low voltage switching circuits, manual and automatic controls and devices, and circuits. Instructors cover switching circuits, manual and automatic controls and devices, line and low voltage switching circuits, ladder and wire diagrams, and controllers and controls applications and operations. *Corequisites: ELT 108, ELT 111, ELT 112*  
*Offered twice per year*

### ELT 119

#### Electricity Principles II (3-2-4)

*Banner Title: Electricity Principles II*

This course introduces students to the theory and applications of varying sine wave voltages and current. Topics include magnetism, AC wave generation, AC test equip-

ment, inductance, capacitance, and basic transformers. Students must pay a \$10 supply fee when registering for this course.

*Prerequisite: IFC 100*

*Corequisites: IFC 101, MAT 1012*

*Offered twice per year*

### ELT 120

#### Residential Wiring I (3-5-5)

*Banner Title: Residential Wiring I*

This course introduces residential wiring practices and procedures. Topics include residential circuits; print reading; National Electrical Code; wiring materials; determining the required number and location of lighting, receptacles, and small appliance circuits; and wiring methods (size and type conductors, box fill calculations, and voltage drop). Topics also include sizing OCPDs (circuit breakers and fuses) and switch control of luminaires and receptacle installation, including bonding, GFCI and AFCi circuits, and special purposes outlets for ranges, cooktops, ovens, dryers, water heaters, and sump pumps. Students must pay a \$10 supply fee when registering for this course.

*Prerequisite: IFC 100*

*Corequisites: ELT 106, ELT 119, ELT 121, IFC 101*

*Offered twice per year*

### ELT 121

#### Residential Wiring II (5-3-6)

*Banner Title: Residential Wiring II*

In this course, students receive additional instruction on wiring practices in accordance with the National Electrical Code standards. Topics include residential single family and two family service calculations, load balancing, panel boards and feeders, residential single-family and two family service installation, and concepts of electrical wiring applications, such as cable TV and CATV installation, swimming pool installation, and remote control lighting and intercom installation. Students must pay a \$10 supply fee when registering for this course.

*Corequisite: ELT 120*

*Offered twice per year*

### ELT 152

#### Photovoltaic Systems Installation and Repair (3-7-5)

*Banner Title: Photovoltaic Systems*

This course provides students with instruction on the specialized field of installing, inspecting, and repairing photovoltaic systems in the electrical construction industry.

*Prerequisite: ELT 119*

*Offered twice per year*

## ENGLISH

Department Code: ENG

### ENG 1010

#### **Fundamentals of English I (5-0-5)**

*Banner Title: Fundamentals of English I*

This course emphasizes the development and improvement of written and oral communication abilities. Topics include analysis of writing techniques, applied grammar and writing skills, editing and proofreading skills, research skills, and oral presentation skills.

*Prerequisites: ENG 097 with a grade of C\* or better and RDG 097 with a grade of C\* or better or placement by diagnostic testing*

*Offered quarterly*

## INDUSTRIAL TECHNOLOGIES FUNDAMENTAL CORE

Department Code: IFC

### IFC 100

#### **Industrial Safety Procedures (2-1-2)**

*Banner Title: Industrial Safety Procedures*

This course provides an in-depth study of the health and safety practices required for maintenance of industrial, commercial, and home electrically operated equipment. Topics include OSHA regulations, safety tools, equipment, procedures, and first aid and cardiopulmonary resuscitation.

*Prerequisite: Provisional admission*

*Offered quarterly*

### IFC 101

#### **Direct Current Circuits I (3-2-4)**

*Banner Title: Direct Current Circuits I*

This introductory course introduces direct current (DC) concepts and applications, including electrical principles and laws; batteries; DC test equipment; series, parallel, and simple combination circuits; and laboratory procedures and safety. Students must pay a \$10 supply fee when registering for this course.

*Prerequisite/Corequisite: MAT 098*

*proficiency level for Electronics*

*Technology and Industrial Systems*

*Technology students; MAT 1012 for*

*other program students*

*Offered quarterly*

## MATHEMATICS

Department Code: MAT

### MAT 1012

#### **Foundations of Mathematics (5-0-5)**

*Banner Title: Foundations of Mathematics*

This course emphasizes the mathematical skills that can be applied to the solution of occupational and technical problems. Topics include properties of numbers, fractions, decimals, percents, ratios and proportions, measurement and conversions, formula manipulation, technical applications, and basic statistics.

*Prerequisite: MAT 097 with a grade of C\* or better or placement by diagnostic testing*

*Offered quarterly*

## SCIENCE AND TECHNOLOGY

Department Code: SCT

### SCT 100

#### **Introduction to Microcomputers (1-4-3)**

*Banner Title: Intro to Microcomputers*

This course introduces the fundamental concepts and operations necessary to use microcomputers. Course content emphasizes basic functions and familiarity with computer use. Topics include computer terminology and an introduction to the Windows environment, networking, word processing, spreadsheets, presentation graphics, and databases.

*Prerequisite: Provisional admission*

*Offered quarterly*