



Industrial Electrician Apprenticeship Level 4 – ELEI4

Trades Training

Program Outline

PROGRAM IMPLEMENTATION DATE: March 2015
OUTLINE EFFECTIVE DATE: June 2021
PROGRAM OUTLINE REVIEW DATE: January 2026

GENERAL PROGRAM DESCRIPTION:

This Industrial Electrician program delivers the Level 4 technical training competencies required in the British Columbia Industrial Electrician apprenticeship trade. Training topics covered in this program include installing and maintaining under and over voltage protection devices, power conditioning, UPS and surge suppression systems, renewable energy generating and storage systems, high voltage systems, non-rotating equipment and associated controls, fire alarm systems, security and surveillance systems, and voice/data/video (VDV) systems. In addition, apprentices install, program and maintain building automation systems, automated control systems, pneumatic and hydraulic control systems as well as pumping systems.

Credentials Granted: Upon successful completion of the 10-week level 4 Industrial Electrician Apprenticeship program, students will receive:

- Level 4 technical training credit for Industrial Electrician Apprenticeship program.

Delivery: This program is delivered face to face as a block intake.

Time for this program: 10 weeks

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Theory based training (approximately per day)	90%
Practical shop floor training (approximately per day)	10%
Trades Contact Hours	28 hrs/wk

Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-job Experience	N/A
Formal Work Experience	N/A
Other	N/A
Total	

Program Outline Author or Contact:

Dave Murdoch, CE-RSE, IE-RSE, IE Registered Assessor, FSR, BA

Signature

APPROVAL SIGNATURES:

Department Head
Joy Brown
E-mail: jbrown3@cotr.bc.ca

Dean of Trades and Technology
Dr. Jack Moes
E-mail: jmoes@cotr.bc.ca

Department Head Signature

Dean Signature

EDCO

Valid from: June 2021 – January 2026

Education Council Approval Date

PROGRAM PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: Sponsored Industrial Electrical Apprentice that has successfully completed Year 3 technical training and completed the pre-requisite number of hours of work experience, **OR**

Journeyman Industrial Electrician (for skills upgrading)

Flexible Assessment (FA):

Credit can be awarded for this program through FA Yes No

Prior Learning Credit: Apprentices that have extensive work experience in a trade (in BC or elsewhere) but have never been certified must apply through the Industry Training Authority (ITA) to challenge the certification for advanced placement in a program. Refer to the ITA website (<http://www.itabc.ca/apply-apprenticeship/challenging-exams>) for details regarding the challenge procedure. Trade specific requirements can be found for each trade in the Trades Program Profiles on the ITA website.

Prior Program Number: N/A

Textbooks and Required Resources:

Textbook selection varies by instructor and may change from year to year. At the Program Outline Effective Date the following textbooks were in use (most current edition):

Industrial Electrician – Level 4 Module Pkg
Canadian Electrical Code – Part 1 (2012) (22nd Edition)
Electric Motor Control (Alerich, 9th Edition)
Direct Current Fundamentals (Herman, 8th Edition)
Electrical Wiring – Residential (Mullin, 6th Cdn)
Alternating Current Fundamentals (Herman, 8th Edition)
Electrical Wiring – Commercial (Mullin, 5th Cdn)
Electrical Wiring – Industrial (Smith, 3rd Cdn)
Delmar's Standard Textbook of Electricity (Herman, 5th Edition)

Please see the instructor's syllabus or check COTR's online text calculator <http://go.cotr.bc.ca/tuition/tCalc.asp> for a complete list of the currently required textbooks.

PROGRAM DESIGN:

Apprenticeship programs cover the general area competencies (GAC) for the program as sourced from curriculum documents provided by Industry Training Authority (ITA). The Technical Training Topics are listed under the Technical Training Content section of this document, and related competencies are listed under the Program Competencies section. College of the Rockies is accredited by ITA to deliver apprenticeship programs.

TECHNICAL TRAINING CONTENT:

- IELEC 401 Organize Work**
- Interpret plans, drawings and specifications
 - Identify hazardous locations
- IELEC 402 Install and Maintain Protection Devices**
- Install under and over voltage protection devices
- IELEC 403 Install and Maintain Power Conditioning, Uninterruptible Power Supply (UPS) and Surge Suppression Systems**
- Install power conditioning, UPS and surge suppression systems
 - Maintain power conditioning, UPS and surge suppression systems
- IELEC 404 Install and Maintain Renewable Energy Generating and Storage Systems**
- Install renewable energy generating and storage systems
- IELEC 405 Install and Maintain High Voltage Systems**
- Install high voltage systems
 - Maintain high voltage systems
- IELEC 406 Install and Maintain Non-Rotating Equipment and Associated Controls**
- Install non-rotating equipment and associated controls
 - Maintain non-rotating equipment and associated controls

- IELEC 407 Install and Maintain Signaling Systems**
- Install fire alarm systems
 - Install security and surveillance systems
- IELEC 408 Install and Maintain Communication Systems**
- Install voice/data/video (VDV) systems
- IELEC 409 Install and Maintain Building Automation Systems**
- Install building automation systems
- IELEC 410 Install, Program and Maintain Automated Control Systems**
- Install automated control systems
 - Program automated control systems
 - Optimize system performance
- IELEC 411 Install and Maintain Pneumatic, Hydraulic Control and Pumping Systems**
- Install pneumatic control systems
 - Install hydraulic control systems
 - Install and maintain pumping systems
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PROGRAM COMPETENCIES:

Upon the successful completion of this program, students will be able to

- Interpret plans, drawings and specifications
- Identify hazardous locations
- Install under and over voltage protection devices
- Install power conditioning, UPS and surge suppression systems
- Maintain power conditioning, UPS and surge suppression systems
- Install renewable energy generating and storage systems
- Install high voltage systems
- Maintain high voltage systems
- Install non-rotating equipment and associated controls
- Maintain non-rotating equipment and associated controls
- Install fire alarm systems
- Install security and surveillance systems
- Install voice/data/video (VDV) systems
- Install building automation systems
- Install automated control systems
- Program automate control systems
- Optimize system performance
- Install pneumatic control systems
- Install hydraulic control systems
- Install and maintain pumping systems

The program competencies covered in this program follow Industry Training Authority harmonized curriculum.

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

EVALUATION AND ASSESSMENT:

Assignments	% Of Total Grade
Theory	90%
Practical	<u>10%</u>
Total	100%

Students must maintain an acceptable level of attendance (as described in the College Policies and Procedures), complete all assigned projects and pass all exams to successfully complete the program.

INDUSTRIAL ELECTRICIAN APPRENTICESHIP LEVEL 4			
COTR COURSE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
IELEC 401	Organize Work	7%	0%
IELEC 402	Install and Maintain Protection Devices	4%	0%
IELEC 403	Install and Maintain Power Conditioning, Uninterruptible Power Supply (UPS) and Surge Suppression Systems	4%	0%
IELEC 404	Install and Maintain Renewable Energy Generating and Storage Systems	6%	0%
IELEC 405	Install and Maintain High Voltage Systems	5%	0%
IELEC 406	Install and Maintain Non-Rotating Equipment and Associated Controls	5%	0%
IELEC 407	Install and Maintain Signaling Systems	6%	20%
IELEC 408	Install and Maintain Communication Systems	6%	30%
IELEC 409	Install and Maintain Building Automation Systems	7%	0%
IELEC 410	Install, Program and Maintain Automation Systems	45%	50%
IELEC 411	Install and Maintain Pneumatic, Hydraulic Control and Pumping Systems	5%	0%
	Total	100%	100%
In-school theory / practical subject competency weighting		90%	10%
Final in-school percentage score		IN-SCHOOL %	
In-school Percentage Score Combined theory and practical subject competency multiplied by		70%	
Proprietary Level 4 Exam Percentage Score The exam score is multiplied by		30%	
Final Percentage Score		FINAL	

All apprentices who complete Level 4 of the Industrial Electrician program with a FINAL level percentage score of 70% or greater will write the Interprovincial Red Seal examination as their final assessment.

ITA will enter the apprentices' Industrial Electrician Red Seal Interprovincial examination mark in ITA Direct Access.

A minimum mark of 70% on the examination is required for a pass.

STUDENT RESPONSIBILITY:

Students are expected to follow all College Policies and Practices as outlined in the program handout package. Mastery of trade specific techniques and methods necessary to a given trade requires significant supervised practice. As a result, regular attendance is necessary for success in this program. Students are expected to follow Policy 2.6.2 – "**Vocational Student Withdrawals as a Result of Absence**".

WorkSafeBC regulations apply to all trades programs. Students are expected to follow all safe work practices and have high regard for the safety of others as well as of themselves. Students are responsible to wear personal protective equipment (PPE) as directed. At a minimum, students must provide and wear approved safety footwear and eyewear at all times in the shop. Additional PPE may be required for specific tasks. Students are expected to wear clothing suitable for working safely in the shop.

The shop attendant is also the first aid attendant for the building. Students may only work in the shop during assigned times. If an incident occurs, no matter how minor, it must be reported to the shop attendant immediately.

INDUSTRY SITE VISITS:

There may be off-site field trips organized in the program as opportunity or resources are available during this program. Students **ARE REQUIRED** to arrange their own transportation for such field trips. Students are expected to follow all college policies and procedures when participating in off-campus activities.

STUDENTS MUST PROVIDE THEIR OWN:

- linesman pliers
 - diagonal cutters
 - hacksaw
 - wire strippers
 - Phillips screwdriver
 - torpedo level
 - knife
 - tape measure
 - channel lock pliers
 - 6" crescent wrench
 - Personal digital multimeter minimum 10mΩ/v
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EXAM POLICY:

Students must attend all required scheduled tests and exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the scheduled exam.

Any student who misses a scheduled test or exam without approval will be given a grade of "0" for the exam.

PROGRAM GRADE:

Program grades are assigned as follows:

COM	Completed to defined standard $\geq 70\%$
NCG	No Credit Granted $< 70\%$

Successful completion of the in-school training is defined as a final score of 70% or greater. (ITA website)

ACADEMIC POLICIES:

See www.cotr.bc.ca/policies for general college policies related to course activities, including grade appeals, cheating and plagiarism.

PROGRAM CHANGES:

Information contained in program outlines is correct at the time of publication. Content of the program is revised on an ongoing basis to ensure relevance to changing educational, employment, and marketing needs. The instructor endeavours to provide notice of changes to students as soon as possible. The instructor reserves the right to add material to programs.