



Construction Electrician Apprenticeship Level 4 – ELCC4 Trades Training

Program Outline

PROGRAM IMPLEMENTATION DATE: March 2005
OUTLINE EFFECTIVE DATE: January 2021
PROGRAM OUTLINE REVIEW DATE: September 2026

GENERAL PROGRAM DESCRIPTION:

This 10-week Construction Electrician Level 4 program delivers the skills, knowledge and training required for the 4-level Construction Electrician. Program competencies include applying circuit concepts, installing and maintaining power conditioning, Uninterruptible Power Supply (UPS) and surge suppression systems, installing power conditioning, installing and maintaining protective devices, renewable energy generating and storage, installing and maintaining branch circuitry, airport runway lighting systems, traffic signal lights and controls, non-rotating equipment and associated controls, signaling systems, fire alarm systems, security and surveillance systems, communication Systems, nurse call systems, voice/data/video (VDV) systems and maintaining, installing and programming automated control systems. Safe work habits are important in this trade and are emphasized, reinforced and practiced throughout the program.

Credentials Granted: Upon successful completion of the 10 week Level 4 Construction Electrician Apprenticeship program, students receive:

- Level 4 technical training credit for the Construction 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)	97%
Practical shop floor training (approximately per day)	3%
Trades Contact Hours	28hrs/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:

Kevin Szol, RSE, IE Registered Assessor, FSR-B

Signature

APPROVAL SIGNATURES:

Department Head
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Department Head Signature

Dean Signature

EDCO

Valid from: January 2021 – September 2026

Education Council Approval Date

PROGRAM PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: Sponsored Electrical Apprentice that has successfully completed level 3 technical training and completed the prerequisite number of hours of work experience, **OR**

May accept Journeyperson Electrician for skills upgrading if space available.

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):

Complete Modules Year 4
Canadian Electrical Code; BC Amendments, BC Bulletins, Others as requested.(available through BCSA)

Recommended:

Electric Motor Control, 8TH Edition, by Delmar
Delmar's Direct Fundamentals and Alternating Current Fundamentals, 7TH Ed.
Electrician's Guide to Programmable Controllers, 5th ed. Delmar/COXCO.
Delmar's Standard Textbook of Electricity, 3rd Ed. (Supplemental)
BCIT Workbook

Students receive Provincial Apprenticeship Curriculum pertinent to the apprenticeship level in which they are enrolled.

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:

ELEA 401 **Apply Circuit Concepts**

- Analyze Electronic Circuits

ELEA 402 **Organize Work**

- Interpret plans, drawings and specifications
- Identify hazardous locations

ELEA 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

ELEA 404 **Install and Maintain Renewable Energy Generating and Storage Systems**

- Install renewable energy generating and storage systems

ELEA 405 **Install and Maintain High Voltage Systems**

- Install high voltage systems
- Maintain high voltage systems

- ELEA 406 Install and Maintain Branch Circuitry**
- Install and maintain airport runway lighting systems
 - Install and maintain traffic signal lights and controls
- ELEA 407 Install and Maintain Non-Rotating Equipment and Associated Controls**
- Install non-rotating equipment and associated controls
- ELEA 408 Install and Maintain Signaling Systems**
- Install fire alarm systems
 - Install security and surveillance systems
- ELEA 409 Install and Maintain Communication Systems**
- Install voice/data/video (VDV) systems
 - Install nurse call systems
- ELEA 410 Install and Maintain Building Automation Systems**
- Install building automation systems
- ELEA 411 Install, Program and Maintain Automated Control Systems**
- Install automated control systems
 - Program automated control systems
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PROGRAM COMPETENCIES:

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

- analyze electronic circuits;
- interpret plans, drawings and specifications;
- 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 and maintain airport runway lighting systems;
- install and maintain traffic signal lights and controls;
- install non-rotating equipment and associated controls;
- install fire alarm systems;
- install security and surveillance systems;
- install voice/data/video (VDV) systems;
- install nurse call systems;
- install building automation systems; and
- program automated control 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	97%
Practical	<u>3%</u>
Total	100%

Students must obtain a mark of 70% overall to pass the program.

Students are continually evaluated on practical work in the shop and may request information or update of their performance at any time throughout the length of the program.

CONSTRUCTION ELECTRICIAN LEVEL 4			
COTR COURSE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
ELEA 401	Apply Circuit Concepts	10%	0%
ELEA 402	Organize Work	7%	0%
ELEA 403	Install and Maintain Power Conditioning, Uninterruptible Power Supply (UPS) and Surge Suppression Systems	7%	0%
ELEA 404	Install and Maintain Renewable Energy Generating and Storage Systems	10%	0%
ELEA 405	Install and Maintain High Voltage Systems	10%	0%
ELEA 406	Install and Maintain Branch Circuitry	13%	0%
ELEA 407	Install and Maintain Non-Rotating Equipment and Associated Controls	2%	0%
ELEA 408	Install and Maintain Signaling Systems	12%	100%
ELEA 409	Install and Maintain Communication Systems	7%	0%
ELEA 410	Install and Maintain Building Automation Systems	7%	0%
ELEA 411	Install, Program and Maintain Automated Control Systems	15%	0%
	Total	100%	100%
In-school theory & practical subject competency weighting		97%	3%
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 Apprentices must achieve a minimum of 70% as the final in-school percentage score to be eligible to write the Interprovincial Red Seal exam.		FINAL%	

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

ITA will enter the apprentices' Construction Electrician Red Seal Interprovincial examination mark in ITADA. A minimum mark of 70% on the examinations 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
 - slotted screwdriver
 - Robertson 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 program activities, including grade appeals, cheating and plagiarism.

PROGRAM CHANGES:

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