

**TRADE: ELECTRICIAN
LEVEL / YEAR: ONE (300 HRS)**

Apprenticeship Course Outline

(based on former ITAC curriculum)

		% of HRS
Module	1 FUNDAMENTALS	10
	Apply concepts of work, power and energy	
	Describe machine applications	
	Apply principles of electricity	
	Apply concepts of electric circuits	
	Describe electrical circuit components	
Module	2 DC CIRCUIT ANALYSIS	29
	Analyze series circuits	
	Analyze parallel circuits	
	Analyze combination circuits	
	Analyze voltage divider circuits	
	Analyze bridge circuits	
	Describe common conductors	
	Calculate conductor resistance	
	Analyze three-wire (Edison) circuits	
Module	3 ELECTROMAGNETISM AND APPLICATIONS	10
	Describe principles of Electromagnetism	
Module	4 METERS AND TEST EQUIPMENT - PART 1	7
	Describe features of common meters	
	Use meters for voltage measurements	
	Use meters for current measurements	
	Use meters for resistance measurements	
	Use meters for power and energy measurements	
Module	5 PRINTS & DRAWINGS	7
	Read and Interpret working drawings and sketches	
	Read and interpret electrical drawings	
Module	6 AC MOTOR CONTROLS - PART 1	10
	Connect and test manual motor starters	
	Connect and test magnetic motor starters	
Module	7 ELECTRICAL CODE AND WIRING - PART 1	17
	Describe Safe Work Practices	
	Describe the application of the Canadian Electrical Code (CEC)	
	Describe residential wiring practices	
	Apply appropriate rules of the CEC to residential type wiring installations	
Module	8 INDUSTRIAL POWER ELECTRONICS - PART 1	10
	Connect and test semiconductor diodes	
	Describe the features of junction transistors	

100%

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LEVEL / YEAR: TWO (300 HRS)**

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% of HRS

Module	Course Title	% of HRS
9	AC FUNDAMENTALS	6
	Apply trigonometry in electrical calculations	
	Apply vectors in electrical calculations	
	Describe principles of alternating current	
10	METERS AND TEST EQUIPMENT - PART 2	4
	Use and oscilloscope for circuit measurements	
11	SINGLE PHASE AC CIRCUITS	29
	Describe the principles of inductance	
	Describe principles of capacitance	
	Describe the effects of inductive reactance	
	Describe the effects of capacitive resistance	
	Describe the effects of impedance and power factor	
	Analyze series AC circuits	
	Analyze parallel AC circuits	
	Apply principles of power factor correction	
12	CIRCUIT PROTECTION DEVICES	6
	Describe circuit protection devices	
13	SINGLE PHASE TRANSFORMERS	11
	Apply transformer fundamentals	
	Connect and test multi-winding transformers	
	Describe voltage regulation and tap changing equipment	
	Connect and test autotransformers	
	Connect and test instrument transformers	
14	AC MOTOR CONTROLS - PART 2	11
	Connect and test pilot and auxillary control devices	
15	LIGHTING	7
	Describe lighting fundamentals	
	Connect and test incandescent lighting circuits	
	Connect and test fluorescent lighting circuits	
	Connect and test high-intensity discharge (HID) lighting circuits	
16	INDUSTRIAL POWER ELECTRONICS - PART 2	11
	Connect and test single-phase rectifier circuits	
	Connect and test transistor circuits	
17	ELECTRICAL CODE AND WIRING - PART 2	15
	Apply appropriate rules of the CEC to single-phase wiring installations	

100%

**TRADE: ELECTRICIAN
LEVEL / YEAR: THREE (300 HRS)**

Apprenticeship Course Outline

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% of HRS

Module	18 THREE-PHASE AC CIRCUITS	14
	Analyze wye and delta connections	
	Apply principles of power factor correction	
Module	19 THREE-PHASE TRANSFORMERS	14
	Connect and test three-phase transformer banks	
	Connect and test three-phase autotransformers	
	Connect and test three-phase instrument transformer circuits	
Module	20 DC MACHINES AND CONTROLS	11
	Connect and test DC generators	
	Connect and test DC motors	
	Connect and test DC motor controllers	
Module	21 AC MACHINES	17
	Connect and test squirrel-cage induction motors	
	Connect and test wound-rotor induction motors	
	Connect and test synchronous motor starters	
	Connect and test single-phase motors	
	Connect and test three-phase alternators	
Module	22 AC MOTOR CONTROLS - PART 3	9
	Connect and test reduced voltage starters	
	Connect and test wound-rotor motor controllers	
	Connect and test synchronous motor starters	
	Connect and test multi-speed motor controllers	
	Connect and test motor braking and deceleration controls	
Module	23 INDUSTRIAL POWER ELECTRONICS - PART 3	20
	Connect and test thyristor circuits	
	Connect and test three-phase rectifier circuits	
	Describe basic logic gates	
	Connect and test op-amp circuits	
Module	24 ELECTRICAL CODE AND WIRING - PART 3	15
	Apply appropriate rules of the CEC to three-phase wiring installations	
	Describe commercial wiring practices	

100%

TRADE: ELECTRICIAN LEVEL / YEAR: FOUR (300 HRS)

Apprenticeship Course Outline

(based on former ITAC curriculum)

		% of HRS
Module 25	APPLIED TRADE CONCEPTS	7
	Apply principles of alternating current	
	Apply principles of AC circuits	
	Apply principles of electrical circuits and equipment	
Module 26	INDUSTRIAL COMPUTING	7
	Install computer hardware and software	
	Use computer operating systems and networks	
Module 27	DIGITAL LOGIC	11
	Connect and test digital logic circuits	
Module 28	PROGRAMMABLE LOGIC CONTROLLERS	13
	Describe principles of programmable controllers	
	Describe PLC programming	
	Perform PLC operations	
Module 29	HIGH VOLTAGE INSTALLATIONS	7
	Describe high voltage AC distribution systems	
	Describe high voltage cables and terminations	
	Describe high voltage AC switchgear and fuses	
	Describe high voltage protective relaying	
	Describe high voltage test equipment	
	Describe industrial wiring practices	
Module 30	MODERN BUILDING SYSTEMS	17
	Describe signal, communication and alarm systems	
	Describe emergency power systems	
	Describe heating, ventilating and air conditioning control systems	
	Describe Photovoltaic systems	
	Describe Data Cabling	
Module 31	AUTOMATED CONTROL SYSTEMS	10
	Describe principles of process controls	
Module 32	VARIABLE SPEED DRIVES	10
	Connect and test adjustable speed DC drives	
	Connect and test variable frequency AC drives	
Module 33	ELECTRICAL CODE AND PRINT READING	18
	Read and interpret electrical construction drawings	
	Apply appropriate rules of the CEC to wiring installations	

100%

Due to the redevelopment of apprenticeships in BC course outlines are subject to change without notice. These course outlines are intended for use as an interim guide in the transition period.