



Fourth Period Technical Training

- Electrician -

(12 Weeks @ 30 Hours per Week = 360 hours)

Instructor(s):

Office Hours:

Monday through Friday: 8:00 AM – 4:30 PM

Jason Lalonde - Chair

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Tim Thomas - Instructor

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Tim Weldon - Instructor

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timothy.weldon@keyano.ca

Required Textbooks: (available at Keyano College Bookstore approximately 2 weeks prior to start date)

First Period Electrician Apprenticeship ILMs w/supplemental texts
Alberta Learning, Edmonton: Author, 1998–, SKU 2001323

2018 Canadian Electrical Code, Part I, 24th Edition
Canadian Standards Association
Rexdale: Canadian Standards Association, 2018, ISBN 9781488313431

Alberta Fire Alarm System Guide, 3^d Edition 2017
Based upon the Alberta Building Code and Alberta Fire Code – ISBN 9788450001846

Optional References:

IPT's Electrical Handbook
Putz, Herb, IPT Publishing and Training, Ltd, 2008, ISBN 978-0920855980

http://www.tradesecrets.gov.ab.ca/trades/pdf/trade_textbooks/003_textbooks.pdf

Direct Current Fundamentals, 8th edition
Herman, Stephen L., Thomson: Delmar, ISBN 978-1111127466

Industrial Motor Control by Herman 7th Edition
Stephen L. Herman, Delmar Cengage Learning 2010, ISBN 978-1133692683

Alternating Current Fundamentals by Duff-Herman – 8th Edition
Stephen L. Herman, Thomson Delmar Learning, ISBN 9781111125271

Electrician Program Supplies (Required for all periods):

- 3-ring binders, dividers, and lined paper
- 6 or 12 inch ruler
- Pens, pencils, highlighters, erasers
- Calculator (with no programmable memory; Sharp 520W, 520X, 520XT or 546XT are recommended)
- CSA approved safety boots
- Safety Glasses
- Gloves – Mechanix are recommended
- Electrical stencil is recommended
- Although classes are scheduled in person, we ask that all students are prepared with the technology required for virtual classes (online) should it become necessary; Computer/laptop, microphone, camera and internet access.

Course Description:

In the Forth Period Technical Training you will learn about:

1. Machines
2. Control and Switching/PLC
3. Fire Alarm Systems
4. Application of Electronics
5. Canadian Electrical Code Part 1 / Applications and Safety

Learning Outcomes

Upon successful completion of Section One – *Machines* – you will be able to:

1. Perform fourth period math calculations.
2. State the characteristics of alternators and generators.
3. Connect and analyze dc machines
4. Connect and analyze alternators.
5. Connect and analyze synchronous motors.
6. Connect and analyze single phase motors.

Upon successful completion of Section Two – *Control and Switching / PLC* – you will be able to:

1. Interpret a motor control circuit.
2. Convert between wiring and schematic diagrams.
3. Design and connect controls and switching circuits.
4. Connect and analyze special control circuits.
5. Program, connect and analyze a PLC.

Upon successful completion of Section Three – *Fire Alarm Systems & Red Seal Program & Industry Network* – you will be able to:

1. Describe the general principles and components of a fire alarm system.
2. Identify and describe fire detection and alarm system regulations.
3. Determine the criteria for the installation of a fire alarm system and for the location of its components.
4. Connect and troubleshoot fire alarm systems.
5. Recognize arc flash hazards in electrical installations.
6. Use Red Seal products to challenge and Interprovincial examination.
7. Describe the role of the Alberta Apprenticeship and Industry Training Board and the network of industry committees that represent the trades and occupations in Alberta.
8. Implement workplace-coaching skills when training apprentices.

Upon successful completion of Section Four – *Fire Alarm Systems & Red Seal Program & Industry Network* – you will be able to:

1. Connect and analyze rectifiers and battery chargers.
2. Connect and analyze controlled rectifiers.
3. Connect and analyze an uninterruptible power supply (UPS) system.
4. Program, connect and analyze variable frequency drives.

5. State the characteristics of a cathodic protection system.
6. Determine the installation requirements for electric renewable energy systems.

Upon successful completion of Section Five – Canadian Electrical Code Part 1 / Application and Safety – you will be able to:

1. Determine the size of conductors and conduit.
2. Apply the grounding and bonding requirements for electrical installations.
3. Apply the rules for installation of cables, raceways and enclosures.
4. Determine protection and control device requirements for electrical installation.
5. Determine the installation requirements for lighting, emergency systems and unit equipment.
6. Determine the installation requirements for communication systems.
7. Determine the electrical requirements for single dwelling feeder and branch circuits.
8. Determine the installation requirements for motors.
9. Determine the installation requirements for capacitors and transformers.
10. Determine the installation requirements for electric welder.
11. Determine the installation requirements for hazardous and special locations.
12. Determine the installation requirements for patient care facilities.
13. Determine the requirements for high-voltage installations.
14. Determine the installation requirements for various electrical applications.

Grading

Apprentices must successfully meet three criteria to pass technical training.

1. Minimum 65% Theory Component (cumulative weighted average)
2. Minimum 65% on each Practical Component
3. Minimum 50% on every section of study.

Machines	17%
Control & Switching/PLC	20%
Fire Alarm Systems	13%
Applications of Electronics	18%
CEC & Applications, Safety	32%
Total Theory Component	100%
Lab/Shop	100%
Total Practical Component	100%

E-Learning

Technology and internet will impact your online learning experience. It's important that you are able to watch an online video and other course materials, take online quizzes, and participant in a live class with your instructor and other students.

Keyano College operates in a Windows based environment and having the correct tools for online learning is important. Here's a list of recommended system requirements:

Internet Speed

Minimum Internet speeds of 5 Mbps.

Recommended Internet speeds of 25 Mbps (especially if you are sharing your internet at home). Check your internet speed with Fast.com.

System requirements:

Microsoft Windows	Apple
<p>Minimum Requirements:</p> <p>A Windows 10 computer/laptop</p> <ul style="list-style-type: none"> · Minimum 4GB of RAM. · 10GB+ available hard drive storage. · Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). Microsoft Office software is free to all Keyano students and employees. · Microphone, webcam and speakers. A headset with a microphone is recommended. · System updates must be regularly installed. · Anti-Virus / Anti-Malware software 	<p>Minimum Requirements:</p> <p>A Macintosh (V10.14 and above) computer/laptop</p> <ul style="list-style-type: none"> · Minimum 4GB of RAM. · 10GB+ available hard drive storage. · Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). Microsoft Office software is free to all Keyano students and employees. · Microphone, webcam and speakers. A headset with a microphone is recommended. · System updates must be regularly installed. · Anti-Virus / Anti-Malware software.
<p>Recommended Requirements</p> <ul style="list-style-type: none"> · 8GB of RAM · A method of backing up/synchronizing to local or cloud-based storage such as OneDrive is highly recommended. This is included if you complete the setup of KeyanoMail and download MS Office using your Keyano email for free. 	<p>Recommended Requirements</p> <ul style="list-style-type: none"> · 8GB of RAM · A method of backing up/synchronizing to local or cloud-based storage such as OneDrive is highly recommended. This is included if you complete the setup of KeyanoMail and download MS Office using your Keyano email for free.
<p>Chromebooks are not recommended as they are not compatible with testing lockdown browsers.</p> <p>A Microsoft Surface or iPad or iPad Pro may be possible alternatives in some program areas.</p>	

Specific department requirements:

Business and OA programs require Windows 10.

Other programs may utilize Windows based tools as well.

Computer Software

Students will be able to get access to Microsoft Office 365 for Free using Keyano Credentials by [clicking here](#).

Recording of lectures and Intellectual Property

Students may only record a lecture if explicit permission is provided by the instructor or by Accessibility Services. Even if students have permission to record a lecture or lecture materials, students may not publish any of the lectures or lecture materials, this includes any recordings, slides, instructor notes, etc. on any platform. Thus no student is allowed to publish or sell instructor notes without formal written permission. It is important to recognize that the Canadian Copyright Act contains provisions for intellectual property.

ITS Helpdesk

If you are having issues with your student account, you can contact the ITS Helpdesk by emailing its.helpdesk@keyano.ca or calling 780-791-4965.

Important Phone Numbers

- **Candace Trites, Administrative Assistant** **780-791-4881**
Call Candace if you are going to be absent from class or have any general questions or concerns.

- **Craig Cail, Construction Trades & Heavy Industrial Chair** **780-715-3902**
Call Craig if you have any concerns with class work, instructors, or if you require any type of academic accommodations.

Call your instructor if you need information about class work, schedules or if you need extra help to learn the material.

- **Mark Power, Alberta AIT** **780-743-7181**
Call Mark if you have questions about attendance, apprenticeship, or your employer.

- **Security** **780-791-7911**
Call security if you feel threatened while on campus, to report a fire, if you need a door unlocked, or for parking issues.

- **Office of the Registrar**
 - **Registration Assistants** **780-791-4801**
Call this office if you have questions about fees/tuition or class availability.

- **Student Life Calendar** <https://calendar.keyano.ca/student/>
Refer to the Student Life calendar for events and important dates for students.

IMPORTANT NOTICE

Information Regarding Fees and Procedures

If the address listed on your fee assessment sheets is different from your current address, or if your address changes anytime during the duration of your program, please go to the Student Services Centre and fill out the "Change of Address" form as Keyano College requires a current address for you at all times.

Your Student ID cards are available for pick up in the Office of the Registrar. Please have your Student ID # and photo identification available. Apprentices are required to pick up a new Student ID card every Academic Year.

For information on Awards/Bursaries, please contact the Student Services Center either in person or by phone at (780) 791-4894.

Keyano College is a paid parking facility. Parking passes can be purchased at the Bookstore. Current rates can be found at: <https://www.keyano.ca/en/about-us/parking.aspx>

When parking, please be mindful of designated areas ("Reserved", "Metered", etc.) Unreserved, General Parking is available in lots A, B, E and F. Lots C and D are reserved staff parking. If you park in a reserved spot, you can be ticketed even if you have a hang tag or daily pass. Please see the campus map for locations of the parking lots.

Please Note:

- It is now your responsibility to submit your E.I. forms on your own time. (HRDC no longer comes to the college)
- You can submit your registration on-line
<http://www100.hrdcdrhc.gc.ca/ae-ei/dem-app/english/home2.html>
- Or link from <http://www.servicecanada.gov.ca>

CLEARWATER CAMPUS MAP

For classroom MAPS please refer to
SAKC STUDENT HANDBOOK

