Second Period Technical Training

- Electrician -

(8 Weeks @ 30 Hours per Week = 240 hours)

Instructor(s):

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

Jason Lalonde - Chair
        Office CC117 – Clearwater Campus
        Office Phone 780-791-4908
        jason.lalonde@keyano.ca

Kyle Forrest - Instructor
        Office CC117 – Clearwater Campus
        Office Phone 780-792-5736
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Patricia Luedee - Instructor
        Office CC117 – Clearwater Campus
        Office Phone 780-715-3912
        patricia.luedee@keyano.ca

Dawn Ohama - Instructor
        Office CC117 – Clearwater Campus
        Office Phone 780-792-5068
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Tim Thomas - Instructor
        Office CC117 – Clearwater Campus
        Office Phone 780-792-5612
        tim.thomas@keyano.ca

Tim Weldon - Instructor
        Office CC117 – Clearwater Campus
        Office Phone 780-792-5123
        timothy.weldon@keyano.ca

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

Second Period Electrician Apprenticeship ILMs w/supplemental texts
Alberta Learning, Edmonton: Author, 1998–, SKU 2000310

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

Optional References:

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, ISBN9781111125271

Electric Motor Control by Alerich – 10th Edition – Cengage
Stephen L. Herman, Delmar, ISBN 978-113702818

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

Electrician Program Supplies (Required for all periods):

- Small set square and small protractor
- 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 goggles
- Gloves (Mechanix are recommended)
- Electrical stencils are 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 Second Period Technical Training you will learn about:

1. Alternating Current (ac) Circuit Properties
2. RLC Circuits
3. Heating and Cooling Systems
4. Magnetic Controls and Switching Circuits
5. Canadian Electrical Code Part I / Plans and Diagrams

Learning Outcomes

Upon successful completion of Section One – *Alternating Current (ac) Circuit Properties* – you will be able to:

1. Perform second period math calculations.
2. Describe the fundamentals of alternating current (ac).
3. State and analyze the characteristics of ac circuits.
4. Connect and analyze inductors in circuits.
5. Connect and analyze capacitors in circuits.
6. Calculate power, reactive power and apparent power in ac circuits.

Upon successful completion of Section Two – *RLC Circuits* – you will be able to:

1. Connect and analyze ac series circuit containing resistors, inductors or capacitors.
2. Connect and analyze ac series circuits that contain resistors and inductors and circuits that contain resistors and capacitors.
3. Connect and analyze ac series circuits that contain resistors, inductors and capacitors.
4. Analyze parallel ac circuits containing resistors, inductors or capacitors.
5. Connect and analyze ac parallel circuits containing resistors, inductors and capacitors.
6. Connect and analyze single phase power factor correction circuits.

Upon successful completion of Section Three – *Heating and Cooling Systems* – you will be able to:

1. State the principles of automatic controls for heating and cooling systems.
2. State the principles of operation for temperature sensing and control devices.
3. Connect and troubleshoot control circuits in a gas-fired, forced-air heating system.
4. Connect and troubleshoot control circuits in an efficient gas-fired, forced-air heating system.
5. Connect and troubleshoot control circuits in a hot water heating system.
6. Connect and troubleshoot control circuits in a heating and cooling system.
7. Connect and troubleshoot control circuits in a commercial HVAC unit.
8. Describe the components and characteristics of heat trace systems.

Upon successful completion of Section Four – *Magnetic Control and Switching Circuits* – you will be able to:

1. Interpret electrical control drawings.
2. Connect and analyze relays and contactors.
3. Connect and analyze timers and smart relays.
4. Select control and protective devices for a motor branch circuit.
5. Identify the components and applications of magnetic motor starters and overload protection devices.
6. Convert between wiring and schematic diagrams for magnetic controls and switching circuits.
7. Connect and analyze motor control circuits.
8. Connect and analyze NEMA and IEC reversing motor starters.

Upon successful completion of Section Five – *Canadian Electrical Code – Part I / Plans and Diagrams* – you will be able to:

1. Determine the minimum ampacity of conductors to single dwellings.
2. Determine the requirements of a service for a single dwelling.
3. Determine the branch circuit and feeder requirements for a single dwelling.
4. Determine the grounding and bonding requirements for a single dwelling.
5. Determine the service, feeder and branch circuit requirements of an apartment building.
6. Determine the requirements for equipment protection, control, grounding and bonding for apartments and similar buildings.
7. Determine wiring and equipment requirements for capacitor bank installations.
8. Determine the code requirements for sections 68, 72, and 76.
9. Interpret electrical drawings and schematic diagrams.
10. Apply specifications to electrical installations.
11. Interpret commercial electrical construction drawings.

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.

AC Current & Circuit Properties	15%
RLC Circuits	31%
Heating & Cooling Systems	17%
Magnetic Control & Switching	18%
Code, Plans & Diagrams	19%
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
Minimum Requirements: A Windows 10 **computer/laptop** · 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	**Minimum Requirements:** A Macintosh (V10.14 and above) **computer/laptop** · 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.
Recommended Requirements · 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.	**Recommended Requirements** · 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.
Chromebooks are **not** recommended as they are not compatible with testing lockdown browsers. A Microsoft Surface or iPad or iPad Pro may be possible alternatives in some program areas.	

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

MAIN FLOOR

2ND FLOOR

FRANKLIN AVENUE

KING STREET