

SchSkill Trd, Appr & Renew Tech

Basic Electrical

2018-19 Academic Year

Program	Year	Semester
START-Trades Fundamentals Certificate	1	1

Course Code: TFBE 1301	Course Equiv. Code(s): ELEC 2411, TFBE 1351
Course Hours: 42	Course GPA Weighting: 3
Prerequisite: none	
Corequisite: none	
Laptop Course: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Delivery Mode(s): In class <input checked="" type="checkbox"/> Online <input type="checkbox"/> Hybrid <input type="checkbox"/> Correspondence <input type="checkbox"/>	
Authorized by (Dean or Director): Kevin Baker	Date: July 2018

Prepared by		
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Course Description:

This course is designed to introduce the student to an exhilarating trade. The student will have an understanding of electricity, basic wiring methods, components, tools, and authority standards associated with a single family electrical residential installation.

Subject Eligibility for Prior Learning Assessment & Recognition (PLAR):

Prior Learning Assessment and Recognition (PLAR) is a process a student can use to gain college credit(s) for learning and skills acquired through previous life and work experiences. Candidates who successfully meet the course learning outcomes of a specific course may be granted credit based on the successful assessment of their prior learning. The type of assessment method (s) used will be determined by subject matter experts. Grades received for the PLAR challenge will be included in the calculation of a student's grade point average.

The PLAR application process is outlined in <http://www.durhamcollege.ca/plar>. Full-time and part-time students must adhere to all deadline dates. Please email: PLAR@durhamcollege.ca for details.

PLAR Eligibility

Yes No

PLAR Assessment (if eligible):

- Assignment
- Exam
- Portfolio
- Other

Course Learning Outcomes

Course Learning Outcomes contribute to the achievement of Program Learning Outcomes for courses that lead to a credential (e.g. diploma). A complete list of Vocational/Program Learning Outcomes and Essential Employability Skill Outcomes are located in each Program Guide.

Course Specific Learning Outcomes (CLO)

Student receiving a credit for this course will have reliably demonstrated their ability to:

- CLO1 Identify and adhere to all health and safety requirements of the shop as well as all classrooms and Laboratories.
- CLO2 Describe the educational and career opportunities in the Electrical Trade including both the post secondary and apprenticeship models as well as various job opportunities within the profession.
- CLO3 Complete basic electrical trade related projects and labs using appropriate equipment and supplies.
- CLO4 Complete all trade related calculations in a successful manner in relation to the electrical trade.
- CLO5 Apply basic trade knowledge and related terminology to communicate effectively in the electrical trade.

Essential Employability Skill Outcomes (ESSO)

This course will contribute to the achievement of the following Essential Employability Skills:

- EES 1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
- EES 2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- EES 3. Execute mathematical operations accurately.
- EES 4. Apply a systematic approach to solve problems.
- EES 5. Use a variety of thinking skills to anticipate and solve problems.
- EES 6. Locate, select, organize, and document information using appropriate technology and information systems.
- EES 7. Analyze, evaluate, and apply relevant information from a variety of sources.
- EES 8. Show respect for the diverse opinions, values, belief systems, and contribution of others.
- EES 9. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
- EES 10. Manage the use of time and other resources to complete projects.
- EES 11. Take responsibility for one's own actions, decisions, and consequences.

Evaluation Criteria:

The Course Learning Outcomes and Essential Employability Skills Outcomes are evaluated by the following evaluation criterion.

Evaluation Description	Course Learning Outcomes	EESOs	Weighting
Lab #1 Wiring device connection to copper#14awg wire, short answer questions.	CLO1, CLO3, CLO4, CLO5	EES4, EES7, EES9	4
Lab #2 Termination of large sizes of copper and aluminum conductors.	CLO1, CLO3, CLO5	EES1, EES2, EES4, EES10	4
Lab #3 Termination of flexible cord to devices	CLO1, CLO3, CLO4, CLO5	EES1, EES2, EES7, EES10	4
Test #1 Series Circuits Short Answer Questions	CLO3, CLO4	EES3, EES10	10
Lab #4 Termination of modular outlets and coaxial cable connections.	CLO1, CLO2, CLO3	EES4, EES7, EES9	4
Test #2 based on Parallel Circuits.	CLO3, CLO4	EES3, EES10	15
Lab #5 Termination of a Modular Data Plug.	CLO1, CLO3, CLO5	EES4, EES5, EES6, EES9	4
Lab #6 Installation of Residential Smoke detectors using armored and non metallic sheathed cable.	CLO1, CLO3, CLO4	EES2, EES6, EES7	5
Lab #7 Control of a light from one location.	CLO1, CLO3, CLO4, CLO5	EES1, EES4, EES6, EES7, EES9, EES10	5
Lab #8 Control of a light from 2 locations.	CLO1, CLO3, CLO4, CLO5	EES1, EES4, EES5, EES6, EES7, EES9, EES10	4
Lab #9 Control of a light from 3 locations or more.	CLO1, CLO2, CLO3, CLO4	EES1, EES4, EES5, EES6, EES7, EES9	4
Lab #10 Installation of a ground fault circuit interrupter receptacle.	CLO1, CLO3, CLO4, CLO5	EES1, EES2, EES4, EES5, EES7	4
Lab #11 Installation of 20 amp 120volt receptacles and circuits.	CLO1, CLO3, CLO4, CLO5	EES1, EES6, EES7	4
Lab #12 Installation of split switched duplex receptacles.	CLO1, CLO3, CLO4, CLO5	EES1, EES4, EES6, EES7	4
Test #3 Short answer test Based on residential electrical installations.	CLO2, CLO3, CLO4, CLO5	EES3, EES5, EES6, EES7, EES9, EES10	25
Total			100%

Notes:

1. An interim mark will be determined for all first year students to identify their academic progress. This mark will be based on the results of the first test, second test and the in process grade up to the mid term date.

Required Text(s) and Supplies:

1. No materials required

Recommended Resources (purchase is optional):

1. Electrical Code Simplified, Ontario Book 1 -House Wiring Guide.
P.S. Knight, Based on the 25th edition of the Ontario Electrical Safety Code.
ISBN # 978-0-920312-47-6

Policies and Expectations for the Learning Environment:

General Policies and Expectations:

General College policies related to	General policies related to
<ul style="list-style-type: none"> + Acceptable Use of Information Technology + Academic Policies + Academic Honesty + Student Code of Conduct + Students' Rights and Responsibilities can be found on-line at http://www.durhamcollege.ca/academicpolicies 	<ul style="list-style-type: none"> + attendance + absence related to tests or assignment due dates + excused absences + writing tests and assignments + classroom management can be found in the Program Guide (full time programs only) in MyCampus http://www.durhamcollege.ca/mycampus/

Course Specific Policies and Expectations:

You are expected to write all tests at the assigned place, date and time, missing a test, scores a 0(zero). Please note that the scheduling of testing will be posted on DC Connect at the beginning of the course, these dates are when the tests MUST be written. DO NOT schedule vacations/holidays during these times as there are NO make-up dates for missing a test for vacations/holidays!

Please note that all documents(whether original, hard copied, electronic or reproductions) issued by a faculty member, are property of the Electrical Department of the School of Skilled Trades, Apprenticeship and Renewable Technology. This includes, but is not limited to: Lab Worksheets, Quizzes, Tests, and Examinations. The aforementioned documents must be returned to faculty upon request and failure to do so will be treated as academic dishonesty.

Only dedicated calculators are allowed(no cell phones or electronic devices)in class.

If these rules are not followed your final mark will be reduced by 10% for each occurrence.

Durham College is committed to the health and safety of all personnel. Therefore while performing lab assignment(s)/project(s) personnel must adhere to the posted safety rules in the room. Upon failing to do so you may not attend class and your lab assignment will result in a mark of zero.

General Course Outline Notes:

1. Students should use the course outline as a learning tool to guide their achievement of the learning outcomes for this course. Specific questions should be directed to their individual professor.
2. The college considers the electronic communication methods (i.e. DC Mail or DC Connect) as the primary channel of communication. Students should check the sources regularly for current course information.
3. Professors are responsible for following this outline and facilitating the learning as detailed in this outline.
4. Course outlines should be retained for future needs (i.e. university credits, transfer of credits etc.)
5. A full description of the Academic Appeals Process can be found at <http://durhamcollege.ca/gradeappeal>.
6. Faculty are committed to ensuring accessible learning for all students. Students who would like assistance with academic access and accommodations in accordance with the Ontario Human Rights Code should register with the Access and Support Centre (ASC). ASC is located in room SW116, Oshawa Campus and in room 180 at the Whitby Campus. Contact ASC at 905-721-3123 for more information.
7. Durham College is committed to the fundamental values of preserving academic integrity. Durham College and faculty members reserve the right to use electronic means to detect and help prevent plagiarism. Students agree that by taking this course all assignments could be subject to submission either by themselves or by the faculty member for a review of textual similarity to Turnitin.com. Further information about Turnitin can be found on the Turnitin.com Web site.

Learning Plan

The Learning Plan is a planning guideline. Actual delivery of content may vary with circumstances.

Students will be notified in writing of changes that involve the addition or deletion of learning outcomes or evaluations, prior to changes being implemented, as specified in the Course Outline Policy and Procedure at Durham College.

Wk.	Hours:	3	Delivery:	In Class
1	Course Learning Outcomes CLO1, CLO3, CLO4, CLO5			
	Essential Employability Skills EES4, EES7, EES9			
	Intended Learning Objectives Introduction to the course, outlines, and introduction to DC Connect resources. Safety equipment and requirements.			
	Intended Learning Activities Demonstration on the effects of Electricity.			
	Resources and References Handouts and Powerpoints			
	Evaluation Students will not be able to complete labs if no Personal Protective Equipment used during Lab Classes.			
Wk.	Hours:	1	Delivery:	In Class
2	Course Learning Outcomes CLO1, CLO3, CLO4, CLO5			
	Essential Employability Skills EES4, EES7, EES9			
	Intended Learning Objectives Introduction to Resistance, Voltage, and Current.			
	Intended Learning Activities Introduction to Resistance, Voltage and Current and their relationship. Mathematical relationship and formula calculations.			
	Resources and References Power Points			
	Evaluation Ongoing			

Wk.	Hours:	2	Delivery:	Lab
2	Course Learning Outcomes CLO1, CLO3, CLO5			
	Essential Employability Skills EES4, EES7, EES9			
	Intended Learning Objectives Lab #1, Termination methods used in connecting copper wire to screw terminals.			
	Intended Learning Activities Lab #1, Terminations of copper solid#14awg wire to residential grade wiring devices using common installation tools.			
	Resources and References Lab #1 handout.			
	Evaluation Evaluated on the proper terminations as demonstrated in class and as shown in text. Project to be done individually.			Weighting 4
Wk.	Hours:	2	Delivery:	In Class
3	Course Learning Outcomes CLO1, CLO3, CLO5			
	Essential Employability Skills EES1, EES2, EES4, EES10			
	Intended Learning Objectives Series applications of Ohm's Law in a circuit.			
	Intended Learning Activities Calculations of Resistance, Voltage, and Current in a series circuit.			
	Resources and References Power Points			
	Evaluation Short answer test based on Series Circuits			Weighting 10

Wk.	Hours:	1	Delivery:	Lab
3	Course Learning Outcomes CLO1, CLO3, CLO5			
	Essential Employability Skills EES1, EES2, EES4, EES10			
	Intended Learning Objectives Lab#2, Wire Terminations using copper and aluminum wire.			
	Intended Learning Activities Lab #2 Wire Terminations using #8 American wire gauge copper to a stove receptacle and #2 aluminum conductors to lugs.			
	Resources and References Lab #2 handout.			
	Evaluation Short answer questions and practical lab terminations of copper and aluminum wire. Project is done individually. Assessed to industry standards.			Weighting 4
Wk.	Hours:	1	Delivery:	In Class
4	Course Learning Outcomes CLO1, CLO3, CLO4, CLO5			
	Essential Employability Skills EES1, EES2, EES7, EES10			
	Intended Learning Objectives Applications of Ohm's law in a parallel circuit.			
	Intended Learning Activities Circuit calculations in parallel connections.			
	Resources and References Power Points and handouts			
	Evaluation Ongoing			

Wk.	Hours:	Delivery:
	2	Lab
4	Course Learning Outcomes CLO1, CLO3, CLO4, CLO5	
	Essential Employability Skills EES1, EES2, EES7, EES10	
	Intended Learning Objectives Lab #3, Termination of flexible cord to 15 amp 120volt devices.	
	Intended Learning Activities Assembly of 20 amp and 15 amp 120 volt connectors to a length of flexible cord and test for connections.	
	Resources and References Lab #3 handouts	
	Evaluation	Weighting
Short answer questions and completion of project to industry standards. To be done individually. Tested for operation.		4
Wk.	Hours:	Delivery:
	1	In Class
5	Course Learning Outcomes CLO4	
	Essential Employability Skills EES3, EES4, EES10	
	Intended Learning Objectives Test #2 Parallel Circuits short answer questions	
	Intended Learning Activities Parallel Circuits	
	Resources and References Power points and hand outs	
	Evaluation	Weighting
Test on Parallel circuit calculations.		15

Wk.	Hours:	2	Delivery:	Lab
5	Course Learning Outcomes CLO1, CLO2, CLO3			
	Essential Employability Skills EES4, EES7, EES9			
	Intended Learning Objectives Lab #4, Installation of RG/6 Coaxial cable with crimp on connectors.			
	Intended Learning Activities Terminations of RG/6 Coaxial cable Omni seal connectors, assemble a short patch cord and testing .			
	Resources and References Lab #4 Handout			
	Evaluation Practical lab and short answer questions to hand in. To be done individually to industry standards.			Weighting 4
Wk.	Hours:	1	Delivery:	In Class
6	Course Learning Outcomes CLO4			
	Essential Employability Skills EES3, EES4, EES5, EES10			
	Intended Learning Objectives Take up test on Parallel Circuits.			
	Intended Learning Activities Take up test on Parallel Circuits Introduce UTP Cable.			
	Resources and References N/A			
	Evaluation Ongoing			

Wk.	Hours:	Delivery:
	2	Lab
6	Course Learning Outcomes CLO1, CLO3, CLO5	
	Essential Employability Skills EES4, EES5, EES6, EES9	
	Intended Learning Objectives Lab #5 Termination of 4 pair Modular Plugs used for Datacomm installations	
	Intended Learning Activities Termination of 4 pair Modular plugs on Cat 5e Cable. Assemble and test to ensure proper operation.	
	Resources and References Ideal Electric Data com handout, Lab #5.	
	Evaluation Short answer questions and hands on termination project to hand in. Project is done individually. Wired and tested to EIA/TIA 568A Standard.	Weighting 4
Wk.	Hours:	Delivery:
	1	In Class
7	Course Learning Outcomes CLO1, CLO3, CLO4	
	Essential Employability Skills EES2, EES6, EES7	
	Intended Learning Objectives Installation of residential smoke detectors and circuit requirements for single family dwellings.	
	Intended Learning Activities Demonstrate the typical installation of residential smoke detectors.	
	Resources and References Power points	
	Evaluation Ongoing	

Wk.	Hours:	Delivery:
	2	Lab
7	Course Learning Outcomes CLO1, CLO3, CLO4	
	Essential Employability Skills EES2, EES6, EES7	
	Intended Learning Objectives Lab #6 Installation of residential smoke detectors and circuit requirements for single family dwellings. Student project board to be used.	
	Intended Learning Activities Installation of residential smoke detectors and 1 duplex outlet with armored cable and non metallic sheathed cables.	
	Resources and References Lab #6 Handout.	
	Evaluation	Weighting
Short answer questions and hands on lab of 2 smoke detectors and 1 duplex outlets. Paperwork to be handed in individually and the project done in partners not to exceed 2 students.		5
Wk.	Hours:	Delivery:
	1	In Class
8	Course Learning Outcomes CLO3, CLO4, CLO5	
	Essential Employability Skills EES4, EES5, EES6, EES7, EES10	
	Intended Learning Objectives Installations of lighting fixtures in residential buildings.	
	Intended Learning Activities Review of requirements for lighting fixtures in residential buildings.	
	Resources and References Power points, text reference.	
	Evaluation Ongoing	

Wk.	Hours:	Delivery:
	2	Lab
8	Course Learning Outcomes CLO1, CLO3, CLO4, CLO5	
	Essential Employability Skills EES1, EES4, EES6, EES7, EES10	
	Intended Learning Objectives Installation of a light fixtures and control from one location using student project board.	
	Intended Learning Activities Installation of a light fixture controlled from one location. Power supplied at the light fixture and also power supplied at the switch location.	
	Resources and References Lab #7 Switching of a light fixture from one location wired with power at the switch and wired with power at the light fixture	
	Evaluation	Weighting
Short answer questions with a hands on installation of a light fixture controlled from one location. Questions to be completed individually and the wiring project done in groups of no more than 2 students.		5
Wk.	Hours:	Delivery:
	1	In Class
9	Course Learning Outcomes CLO3, CLO4, CLO5	
	Essential Employability Skills EES1, EES4, EES5	
	Intended Learning Objectives Installation of wiring for Kitchens and equipment installed.	
	Intended Learning Activities Installation of wiring for Kitchens and equipment installed.	
	Resources and References Power Points	
	Evaluation Ongoing	

Wk.	Hours:	Delivery:
	2	Lab
9	Course Learning Outcomes CLO1, CLO3, CLO5	
	Essential Employability Skills EES1, EES4, EES5, EES7, EES10	
	Intended Learning Objectives Installation of 3 way switch circuits using the student project boards.	
	Intended Learning Activities Installation of 3 way switch circuits. Power supplied at the lamp holder.	
	Resources and References Lab #8 3 Way switch controls of lighting.	
	Evaluation	Weighting
Short answer questions and hands on lab. Questions are to be handed in individually and the wiring to be done in groups not to exceed 2 students. To be wired to industry standards and codes.		4
Wk.	Hours:	Delivery:
	1	In Class
10	Course Learning Outcomes CLO3, CLO4, CLO5	
	Essential Employability Skills EES4, EES5, EES6, EES7, EES9	
	Intended Learning Objectives Installation of special electrical equipment in laundry room, bathrooms and garages.	
	Intended Learning Activities Installations of special electrical equipment in laundry rooms, bathrooms and garages.	
	Resources and References Power point presentations	
	Evaluation Ongoing	

Wk.	Hours:	Delivery:
	2	Lab
10	Course Learning Outcomes CLO1, CLO3, CLO4	
	Essential Employability Skills EES1, EES4, EES5, EES6, EES7	
	Intended Learning Objectives Installation of 4 way switch controls of lighting using the student project boards.	
	Intended Learning Activities Installation of 4 way switch controls of lighting.	
	Resources and References Lab #9 4 way switch controls of lighting	
	Evaluation	Weighting
Short answer questions and hands on project. Questions to be handed in individually and the project board to be wired in groups not to exceed 2 students. To be wired to industry standards and codes.		4
Wk.	Hours:	Delivery:
	1	In Class
11	Course Learning Outcomes CLO3, CLO4, CLO5	
	Essential Employability Skills EES1, EES2, EES5, EES6, EES7, EES9	
	Intended Learning Objectives Introduction to residential services and wiring methods used.	
	Intended Learning Activities Introduction to residential services and wiring methods used. Electrical Inspection forms and fees.	
	Resources and References Power points	
	Evaluation Ongoing	

Wk.	Hours:	Delivery:
	2	Lab
11	Course Learning Outcomes CLO1, CLO3, CLO4, CLO5	
	Essential Employability Skills EES4, EES5, EES6, EES10	
	Intended Learning Objectives GFCI Receptacle installation wired on the project board, feed through connected to a second duplex receptacle.	
	Intended Learning Activities GFCI Receptacle installation wired on the project board, feed through connected to a second duplex receptacle.	
	Resources and References Lab #10 GFCI Receptacle installation	
	Evaluation	Weighting 4
Short answer questions and hands on project. Questions to be done individually and lab wired in groups not to exceed 2 students. To be wired to industry standards and codes.		
Wk.	Hours:	Delivery:
	1	In Class
12	Course Learning Outcomes CLO3, CLO4, CLO5	
	Essential Employability Skills EES3, EES4, EES5	
	Intended Learning Objectives Residential Service Calculation.	
	Intended Learning Activities Demonstration of a residential service demand calculation. Using online demand calculator linked in DC Connect.	
	Resources and References Power point	
	Evaluation Ongoing	

Wk.	Hours:	Delivery:
	2	Lab
12	Course Learning Outcomes CLO1, CLO3, CLO4, CLO5	
	Essential Employability Skills EES3, EES4, EES5	
	Intended Learning Objectives Installation of 2, 20 amp duplex receptacles on the student project boards	
	Intended Learning Activities Installation of 2, 20 amp duplex receptacles on the student project boards.	
	Resources and References Lab #11 Installation of 20amp duplex receptacle circuits.	
	Evaluation Hands on lab to be completed in groups not to exceed 2 students. Project wired to industry standards and codes.	Weighting 4
Wk.	Hours:	Delivery:
	1	In Class
13	Course Learning Outcomes CLO3, CLO4, CLO5	
	Essential Employability Skills EES4, EES5, EES7	
	Intended Learning Objectives Service Grounding and Bonding.	
	Intended Learning Activities Service Grounding and Bonding.	
	Resources and References Power points	
	Evaluation Ongoing	

Wk.	Hours:	Delivery:
	2	Lab
13	Course Learning Outcomes CLO1, CLO3, CLO4, CLO5	
	Essential Employability Skills EES1, EES3, EES4, EES5	
	Intended Learning Objectives Control of a split switched receptacle to be wired on the student project boards.	
	Intended Learning Activities Control of a split switched receptacle with power supplied at the switch and power supplied at the receptacle.	
	Resources and References Lab #12 Control of a split switched outlet.	
	Evaluation Project to be completed in groups not to exceed 2 students and wired to industry codes and standards.	Weighting 4
Wk.	Hours:	Delivery:
	2	In Class
14	Course Learning Outcomes CLO3, CLO4, CLO5	
	Essential Employability Skills EES4, EES7	
	Intended Learning Objectives Class wrap up, test #3	
	Intended Learning Activities Multiple choice test involving residential wiring.	
	Resources and References Labs and questions from labs 1-12 and notes.	
	Evaluation Multiple choice test involving residential wiring installations, service conductor sizing and grounding and bonding of residential services.	Weighting 25

Wk.	Hours: 1	Delivery: In Class
14	Course Learning Outcomes CLO2, CLO3, CLO4, CLO5	
	Essential Employability Skills EES1, EES2, EES4	
	Intended Learning Objectives Short Video promotions and links	
	Intended Learning Activities Introduce Apprenticeship Resources for the Electrical Trade and DC Connect links to assist the students in seeking further studies.	
	Resources and References ECAO resources.	
	Evaluation Reference Material information.	