

# Dauphin County Technical School

6001 Locust Lane  
Harrisburg, Pa 17109



Student Orientation packet &  
COURSE SYLLABUS

**Welcome!**

**Instructor: Mr. Liddick**

*Tom E. Liddick*



# Dauphin County Technical School

## Electrical Construction & Maintenance



Page 1

Welcome to the Electrical Construction and Maintenance Shop (ECM). The purpose of this packet is to welcome and introduce you to the Electrical Construction & Maintenance Program at the Dauphin County Technical School. Technical education may be a new term to you, and what you may see and hear about this educational process may seem entirely different from what you have experienced in your education up to now; or were exposed to when you were a student.

In a Vocational or Technical setting you will find that learning takes place in many different ways and at different speeds this is known as *Competency-Based Education*\*. Students are not always working on the same division or job at the same time and much more emphasis is placed upon the student for assuming responsibility for his or her own education. The harder they work the farther they will get in the program. The student will also be required to use information from academic subject areas in the shop and vice-versa. By “*integrating*” academics and the vocational/technical programs the student should be able to see some relevance and importance of the academic subjects. It is also important for the student to understand the importance of academic classes and that they are a vital part of all the trades and future employment. I work closely with academic teachers and staff. I monitor academic grades, attendance and discipline issues.

One of the 12<sup>th</sup> grade graduation requirements is that the student must have a portfolio and must present a hands-on project to their student peers (Example: How to install a single pole switch). The English teacher will give the guidelines to the student. **IT IS THE STUDENTS RESPONSIBILITY TO DO THIS EARLY IN THEIR 12<sup>TH</sup> GRADE YEAR SO THEY DO NOT JEPORDIZE THEIR GRADUATION REQUIREMENTS!**

I am going to start having the students start their portfolio in their ninth grade year so they will have their shop experiences documented as they work through their individual shop projects.

**Remember you Represent Dauphin County Technical School, Electrical Construction and Maintenance Program and most of all ME! I take this VERY seriously!**

### ***\*Competency-Based Education:***

*Competency-based education is a systematic but flexible learning process, which focuses on defining in measurable terms what students are to learn. Expected behaviors, conditions for their performance, and acceptable standards are specified in advance. Mastery of competencies is determined by evaluation of knowledge and skills utilizing varied assessment methods. Credit for prior learning may be demonstrated through competency validation measures such as testing, demonstration and evaluation of skills, portfolio documentation and evaluation, and employer verification.*

Please take some time and review this packet and feel free to contact me if you have any questions.





## **Course Description**

This Electrical Construction and Maintenance Program have been designed to meet the needs of contractors working in the Harrisburg area and is a 4 year course. Students who consider taking this program should be interested in working as an electrician or in some other allied electrical occupation. Some employment opportunities include residential electrician, commercial electrician, industrial electrician, maintenance mechanic, inspector, communication wiring installer, computer network wiring installer, supply house worker, salesperson, firefighter, fire investigators, etc. Many other occupations also employ persons with an electrical background such as firefighters, fire inspectors, electrical inspectors, and housing and code enforcement officers.

### **Topics Covered/Learning Outcomes**

The program is divided into ten Major Divisions which are also the Learning Outcomes. Normally students' progress from Division to Division in order; but accommodations can be made to tailor a program to the individual needs and experience of the student.

The course is laid out as follows:

### **Major Division I** **Basic Fundamentals**

#### **Safety & Theory**

*Orientation Shop layout Safety Rules*  
*Basic Fundamentals of AC/DC Ohm's Law*  
*Basic Electronics Identifying Meters & Conductors*  
*National Electrical Code*

### **Major Division II** **Residential Wiring**

#### **Hardware, Material, and Tools**

*Identifying materials, Hand tools and Power tools Use of meters*  
*Architectural drawings*

### **Major Division III** **Residential Wiring**

#### **Service Entry Equipment**

*Service Entrances Grounding Branch Circuits*  
*Identifying service materials*  
*National Electrical Code*

## **Major Division IV**

### **Residential Wiring**

#### **Residential Rough-in wiring**

*Interior Rough-In Wiring & Special wiring situations*

*Requirements & Techniques*

*Material installations*

*Use of Hand tools and Power Tools*

*Splices, Terminations & Circuit Requirements*

*National Electrical Code*

## **Major Division V**

### **Residential/Commercial Wiring**

#### **Finish/Trim Out**

*Interior Trim-Out Wiring Selecting Proper Overcurrent Protection*

*Trimming out Residential Panel*

*National Electrical Code*

## **Major Division VI**

### **Residential/Commercial Wiring**

#### **Prepare and Run Conduit**

*Interior Rough-In Wiring & Special wiring situations*

*Requirements & Techniques Material installations*

*Conduit Installation and preparation Raceway Types and Installations*

*Identifying different Raceways*

*National Electrical Code*

## **Major Division VII**

### **Residential/Commercial Wiring**

#### **Understand and Install Data Wiring Installation**

*Identifying material and Distribution*

*National Electrical Code*

## **Major Division VIII**

### **Residential/Commercial Wiring**

#### **Maintaining & Troubleshooting Electrical Wiring Systems**

*Review on Testers*

*Techniques to Troubleshooting & Maintaining Electrical Systems*

*National Electrical Code*

## **Major Division IX**

### **Commercial/Industrial Electricity**

#### **Understanding and Install AC Industrial Controls**

*Power and Transformers AC Industrial Controls*

*DC Industrial Controls Digital Electronic Fundamentals*

*Industrial Measurement and Control*

*National Electrical Code*

**Major Division X**  
**Residential/Commercial/Industrial Electricity**  
 National Electrical Code  
*Understanding How to use The National Electrical Code*



**HACC**

Central Pennsylvania's Community College

<http://www.hacc.edu/>

**College in the High School:**

The listed courses are now available as HACC College in the Technical School credits:

<b>GTEC 101 Safety in the Workplace</b>	<b>3 Credit</b>
10 <sup>th</sup> or 11 <sup>th</sup> Grade Fall Semester (1 <sup>st</sup> & 2 <sup>nd</sup> Marking period)	
<b>ELOC 172 National Electric Code</b>	<b>2 Credit</b>
10 <sup>th</sup> or 11 <sup>th</sup> Grade Spring Semester (3 <sup>rd</sup> & 4 <sup>th</sup> Marking period)	
<b>ELOC 157 Electrical Wiring I</b>	<b>4 Credit</b>
11 <sup>th</sup> & 12 <sup>th</sup> Grade Spring Semester (3 <sup>rd</sup> & 4 <sup>th</sup> Marking period)	
<b>ELOC 163 Electrical Wiring II</b>	<b>4 Credit</b>
11 <sup>th</sup> & 12 <sup>th</sup> Grade spring Semester (3 <sup>rd</sup> & 4 <sup>th</sup> Marking period)	

When the average student have completed 4 years in the Electrical Construction & Maintenance program, you should be equivalent to a 2 or 3 year Electrical Apprentice\*. This would be a person who should know what basic material, hardware, tools and procedures are required to do some of the most basic Electrical jobs.

**\*Apprentice:** One who is learning by practical (hands-on) experience under skilled workers in a trade, art, or calling.

**Course Goals**

**General Goals** are behaviors and expectations that are necessary for anyone to possess if they are going to remain gainfully employed. The satisfactory demonstration of these goals and behaviors is conducive to a smooth operating classroom, shop, or worksite.

- The expectations that are set forth by me are **High**
- Respect the rights and property of others.
- Be on time and be mentally and physically prepared to work.
- Stay on task & Worry about yourself!!!
- Do not interfere with others or allow them to distract you.
- Handle conflicts in a mature way.
- Complete and submit forms, timesheets, and documentation in a timely manner.
- Assist underclassmen and freshmen; as you would expect others to help you.

**Trade Related Goals** is trade related information that the student should be able to explain or demonstrate. These goals include the ability to define and/or explain various electrical and trade terminologies. The goals also include demonstrating practical aspects of the trade through the satisfactory completion of trade related projects.

TECH

## Evaluation / Grading Procedures

Job-sheets are evaluated on the individual's ability. Jobs must be completed in a satisfactory manner and according to the National Electrical Code before moving onto the next task. Quizzes and tests will also be used to measure the individual student's knowledge.

Grading is done on an individual basis using a 10 point scale and is done everyday.

10- Outstanding (Achievement as it relates to the student's ability)

9 – Excellent “

8 – Very Good “

7 – Good “

6 – Average “

5 – Below average “

1-4 Improvement is much needed: For students who have little understanding of basic ideas, shows little progress and fails to follow directions.

0 – Work not completed in ISS or OSS

Many things are taken into account. Some of them are:

- |                                |  |                               |
|--------------------------------|--|-------------------------------|
| ○ Attitude (Respect)           | ○ Workmanship                            | ○ Neatness                    |
| ○ Ability to follow directions | ○ Student Interest                       | ○ Ability to work with others |
| ○ Be on-time                   | ○ Attendance                             | ○ Responsibility              |
| ○ Start work on-time           | ○ Safety Habits (glasses & proper dress) | ○ Use Of Time                 |

### **NOTICE! Electrical Construction & Maintenance syllabus Change:**

All academic grades must be in good academic standing. Students who do not meet this requirement will receive an academic warning and a call home to parents. All students on academic warning will be unable to work in shop on shop competencies. When on an academic warning status, student will be required to do book work from the National Electrical Code and Residential Wiring Academy text book until grades improve.

### **Textbooks and References**

The program uses many Textbooks and references. These are made available to the student as desired or needed. Some of them include:

- Residential Construction House Wiring (Student will need to purchase if damaged) \$65.00
- Understanding Electricity & Terms
- Understanding The National Electrical Code

### **Website and Hyperlinks**

**Dauphin County Technical School:**



<http://www.dcts.org/C&T/ECM/ecm.html>

**ECM Pa Dept of Education Web Page at the link below:**



<http://websites.pdesas.org/rliddick/default.aspx>

**ECM Facebook page:**



<http://www.facebook.com/platform#!/pages/Electrical-Construction-Maintenance/180562408620443>



<http://www.hacc.edu/>



### Shop Rules

1. Students and Parents have access to my personal phone# and email for question pertaining to the school, shop and or trade, under **NO** circumstances will personal phone calls, text messages or emails be tolerated, they will be forwarded to administration for discipline action.
2. **THINK!!!!** If you think it is wrong, don't do it....
3. Have **POSITIVE** attitude..... Negative attitude **WILL** hurt your grade
4. Students must carry Handbook at all time. **All** rules in handbook apply in shop
5. **RESPECT** the rights, needs, and possessions of others (**RESPECT IS EARNED**)
6. Do **Not** talk or interrupt Instructor, Adult or other student while they are talking. This includes talking on phone.
7. Be on time and prepared for class. (Pencil, book, notebook and necessary tools)  
**Tardiness will Not be tolerated.**
8. Professional Dress: Shop shirts, Pants, OSHA approved boots and glasses **MUST** be worn **ALL DAY**.
9. Dirty clothing or clothing with holes, Shorts, Clam diggers, sleeveless shirts, hats, outside jackets, flip flops, sneakers, etc. will **not** permitted in shop.
10. All personal belongings **MUST** be put in your lockers and locked at all times!
11. Long hair must be tied back
12. Notebooks **must** be kept in a neat and orderly fashion.
13. **FOOD OR DRINK IS NOT PERMITTED IN SHOP** and will be taken!!! (Only unopened water is permitted)
14. Students are **NOT** permitted in the hall or construction arena without the Instructor's permission or office approved pass
15. Leaving the shop without the instructor's permission is strictly forbidden!! **NO EXCEPTIONS!!!**
16. Passes to leave shop will **NOT** be given!
17. Take responsibility for learning
18. Follow directions the first time given. If you don't understand ASK a fellow student and then Instructor!
19. Swearing, offensive language, inappropriate messages or drawings on fellow students or school materials is strictly forbidden! This includes studs in house, bathroom walls etc.
20. Power tool or machines are **NOT** to be use without Instructor's permission and proper qualification of the student
21. Students are **NOT** permitted in the instructor's office, on computer and tool room!!!
22. Phones or Music Devices are strictly forbidden. **NO EXCEPTIONS! They will be taken.**
23. If you are responsible for breaking or defacing equipment, disciplinary actions and or reimbursement for the items will be required.
24. Material or tools that are signed out are the responsibility of the person that signed it out and if not returned that person will be required to reimburse the school.

#### Disciplinary actions:

1. First offence (verbal)
2. 2<sup>nd</sup> offence possible writing assignment or essay
3. 3<sup>rd</sup> offence (PM detention ISS or OSS)

**Remember you Represent Dauphin County Technical School, Electrical Construction and Maintenance Program and MOST of all ME! I take this VERY seriously!**

# Emergency Evacuation Procedures

## Fire Drill

1. Stop all work, turn off machines, electricity, gas, etc.
2. Line up at door so teacher can do attendance (Do not leave until told to do so, unless a danger would prohibit you from doing so)
3. All students to remain with the group and proceed to pole number/color shown at door.

## CODE RED

Emergency Situation involving a violent intruder coming into our school to include: active shooters, violent person(s) suspected of being armed person. Ignore fire alarms. (LOCKDOWN)

Who should call?

ANYONE who has credible or first hand knowledge of such a threat should immediately call the Main Office by dialing "888".

### ACTION PLAN:

1. **IMMEDIATELY** move students into the closest room that can be locked. Classrooms are fine; however any room with a lock will work!
2. **LOCK DOORS / LIGHTS ON.**
3. **MOVE** students out of sight away from door windows. **INSTRUCT** students to get into a prone position at the first sound of gun fire.
4. Keep students **QUIET** / write down name and number of students in your room.
5. WAIT for instructions > "CODE GREEN"

### ACTION PLAN: (Cafeteria, Arena)

1. **MOVE AWAY FROM THREAT!!!**  
Do not attempt to secure students in an unsecurable location... (*Columbine H. S.*)
2. Students & Teachers near exit doors should **IMMEDIATELY MOVE OUTSIDE** (at least 150 yards from building)

### ACTION PLAN: (Library)

1. **MOVE AWAY FROM THREAT** to nearest securable room and follow "Action Plan" guidelines.

**CODE YELLOW** Non-Threatening INTRUDER: This person can best be described as a *non-violent, but non-compliant person* on school property without authorization.

Who should call? ANYONE who has knowledge of intruder should immediately call the Main Office by dialing “888”.

**ACTION PLAN:**

1. Take Attendance.
2. ALL STUDENTS ARE TO REMAIN in their classrooms. No students are permitted in the hallways.
3. Keep students reasonably QUIET. If subject is in your classroom leave telephone off hook for monitoring purposes.
4. Holds students in classrooms until “CODE GREEN” or “ALL CLEAR” has been announced. Ignore BELL SCHEDULE, but act on fire alarms.

**CODE 24**

Medical Emergency: ALL students and visitors are to ignore period bells and remain in their classrooms until a “CODE GREEN” or the “ALL CLEAR” has been announced. Medical Emergency Response Team will respond to deal with the situation.

---

**CODE GREEN**

or “ALL CLEAR”. ALL Students & Faculty may return to their normal day. ONLY SCHOOL ADMINISTRATION MAY ANNOUNCE A CODE GREEN.

This document supersedes all previous instructions regarding code responses.



# Dauphin County Technical School

## Electrical Construction & Maintenance



COURSE SYLLABUS and RELATED INFORMATION

Page 9

### Signature Page & Tool List

I (we) have read the attached Course Syllabus Page 1 thru signature page and understand the purpose and goals for the program. I (we) also understand the topics that will be made available to the student and the evaluation and grading procedures that will be used to keep track of the students' progress. Textbooks and reference materials will be made available to the student as they need or desire them and numerous reference books are available for independent use. It is expected that as the student advances through the program he/she will begin to purchase hand tools to be used in the program and for the Cooperative Education experience. Any tools brought into the shop are the responsibility of the student other than tools listed below on tool list. Student will be required to reimburse the school if any Tools, Books, and or Materials are lost or intentionally broken and or defaced. Disciplinary actions may occur.

UTILITY KNIVES are to be brought to school without a blade; they will be supplied in the shop and will stay there.

I have read and understand the attached course syllabus, student expectations, and consequences for misbehavior.

Student Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Parent(s) Guardian(s): \_\_\_\_\_

Date: \_\_\_\_\_

Parents/Guardians are *encouraged* to visit the shop anytime. Please make prior arrangements through the Career Counseling Office, Principle's and Instructor. If you have any questions or concerns please contact me or the School.

Ryan E. Liddick – Instructor

School Email: [RLiddick@dcts.org](mailto:RLiddick@dcts.org)

Phone: 717-652-3170 Ext: 1406

Personal Cell (717-648-0383)



### Minimum Suggested Tool List

This is a list of tools that will be required by most employers for a beginning worker. This is only a minimal list; you can, and should, add tools, as you are able. The tools that have a \* and are typed in **bold** should be purchased before you begin working in the school shop. You should have all of these tools within a short time after you are employed. You may wish to have a prospective employer look over this list; they may wish to add or delete some items depending on what type of work you will be doing.

School and Personal tools used in the shop are the total responsibility of the student they are assigned to. They should not be left unattended nor should they be left in the shop when you are not here. If you get free or reduced lunches and cannot purchase the tools listed below please contact me via phone, email or have your child talk to me privately.

**LOCK THEM UP!!!**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>*1 <b>Tool Box with Lock</b></li> <li>1 <b>Allen wrench set</b></li> <li>*1 <b>Tool Pouch</b></li> <li>*1 <b>Tool Belt</b></li> <li>1 <b>Pencil</b></li> <li>*1 <b>Screwdriver, 3" #1 Phillips Blade</b></li> <li>*1 <b>Screwdriver, 6"x3/16" Straight Blade</b></li> <li>*1 <b>Leather Work Gloves</b></li> <li>*1 <b>Side Cutting Pliers</b></li> <li>2pr Pump Pliers 12"</li> <li>2 Adjustable Wrenches (6" &amp; 10")</li> <li>1 Hack Saw (32 Tooth Blade)</li> <li>1 Triple Tap</li> <li>*1 <b>Compass Saw</b></li> <li>*1 <b>Tape Measure (16')</b></li> <li>*1 <b>Wire Strippers</b></li> <li>*1 <b>Screwdriver, Stubby Straight Blade</b></li> <li>*1 <b>Screwdriver, Stubby Phillips Blade</b></li> <li>*1 <b>Screwdriver, 8"x3/8" Straight Blade</b></li> <li>*1 <b>Nut Driver Set</b></li> </ul> | <ul style="list-style-type: none"> <li>*1 <b>Screwdriver, 4"x1/4" Straight Blade</b></li> <li>*1 <b>Claw Hammer (16oz.)</b></li> <li>*1 <b>Utility Knife (without blade)</b></li> <li>*1 <b>Diagonal Cutting Pliers</b></li> <li>*1 <b>Needle-nose Pliers</b></li> <li>2pr <b>Pump Pliers 10" (Channel locks)</b></li> <li>*1 <b>Safety Glasses (First pair)</b></li> <li>1 Wrench, Pipe 14"</li> <li>*1 <b>Flashlight</b></li> <li>1 Chisel, Cold 3/8"</li> <li>1 Chisel, Wood 3/4"</li> <li>1 Snips, Aviation Right (Compound)</li> <li>1 Snips, Aviation Left (Compound)</li> <li>*1 <b>Awl</b></li> <li>*1 <b>Screwdriver, 4" #2 Phillips Blade</b></li> <li>*1 <b>Screwdriver, 6" #3 Phillips Blade</b></li> <li>*1 <b>Screwdriver, Holding</b></li> <li>*1 <b>Voltage Tester</b></li> <li>*1 <b>Continuity Tester</b></li> </ul> |
|--|--|