

**EDMONDS COMMUNITY COLLEGE**  
**COURSE SYLLABUS**  
**Construction Industry Training Program**

**CIT 106: Electrical, Plumbing,  
and HVAC Trades**

Credits: (3)

Instructor: Randy Sibley

Office Location: RLH 101

Office: 425.640.1827

Office hours: email for appointment

Email: SibleyN@edmonds.wednet.edu

Time: 11:45 to 1:30



**COURSE DESCRIPTION**

Emphasis on electrical and plumbing trades. Introduction to basic electrical theory, Ohm's Law, building simple circuits and basic plumbing applications. Green building science applications for ventilation, air and moisture control. PREREQUISITES: CIT 103 and 104 or OSHA 10 or 30 hour safety card + permission of the instructor.

**REQUIRED MATERIALS:**

1. The Complete Guide to Home Wiring; Including Information on Home Electronics & Wireless Technology; edited by Andrew Karre; Creative Publishing International, Inc, 2005, ISBN 1-5;8923-213-5 (Black & Decker)
2. The Complete Guide To Plumbing; by editors of Creative Publishing; fourth edition, 2008, Creative Publishing Inc, ISBN 978-1-58923-378-2 (Black and Decker)
3. Green from the Ground Up; Sustainable, Healthy, and Energy-Efficient Home Construction, by David Johnston and Scott Gibson, Taunton Press, 2008, ISBN 978-1-56158-973-9. (Also available as an E Book)

**LAB FEE:** per EDCC Class Schedule

**SUPPLIES:**

1. Basic set of hand tools - provided as part of shop equipment
2. Tool belt - provided in class
3. medium sized 3 ring binder
4. architectural scale

5. 8-1/2"x 11" engineering graph paper: 1/4x1/4 squares - available in the bookstore
6. Warm clothes and rain gear

**HANDOUTS:** Additional handouts will be provided during the course and will provide the primary source of information for material assessed on the final exam. These handouts are also available online.

### **OUTCOMES:**

Upon successful completion of this course, students will be able to:

1. Analyze and describe how a basic wiring system works and is installed in a residential project to National Electrical Code (NEC) specifications. [REASON]
2. Analyze and describe how a basic plumbing system works and is installed in a residential project to industry specifications. [REASON]
3. Analyze and describe how the drain, waste and vent systems work and are installed in a residential project, and what basic code requirements govern the typical installation. [REASON]
4. Analyze the skills and aptitudes necessary to become a successful residential electrician or plumber. [EXPLORE]
5. Continuously demonstrate safe worker practices in all lab work. [COMMUNICATE]
6. Demonstrate how to cut, clean, solder and test copper tubing per industry standards. [ACT]
7. Cut, expand, fit and test PEX tubing per industry standards. [ACT]
8. Cut, fit, typical sheet metal ducting and seal per industry standards. [ACT]
9. Analyze how increased energy efficiency alters the standards and details of typical mechanical sub contractor installations per Built Green guidelines. [EXPLORE]

### **ATTENDANCE POLICY:**

Please be on time - attendance will be taken at the beginning of class. Arriving late and leaving early is disruptive to your classmates and the instructor.

New topics are covered during each class. Much of the material is not covered in the text. Any absence excused or not, will influence your grade. If you are absent, you are responsible for getting notes, handouts, etc. from a classmate or

by checking online. Please exchange phone numbers with two students in the class so that you will have someone to contact.

**GRADING:**

|  |            |
|--|------------|
| <b>Attendance &amp; Participation</b>            | <b>15</b>  |
| <b>HVAC Quiz</b>                                 | <b>15</b>  |
| <b>HVAC Diagram</b>                              | <b>15</b>  |
| <b>Supply Piping Exercise - copper &amp; pex</b> | <b>15</b>  |
| <b>Construct Electrical Circuit</b>              | <b>15</b>  |
| <b>Special Project</b>                           | <b>10</b>  |
| <b>Final Exam</b>                                | <b>15</b>  |
| <b>Total Points</b>                              | <b>100</b> |

**Course Outline**

**Step One**

A. Introduction to the mechanical phase of residential construction. Type of work performed, typical subcontractors, codes, permits, design/drawing.

B. Introduction to electrical theory, residential wiring, house wiring process handout, electrical theory handout,

Lab: set up for electrical circuit lab. Students will wire and energize a simple circuit containing a light, switch and outlet, at the minimum.

**Step Two**

Lecture: Special electrical safety devices, GFI location code requirements, arc fault breakers, purpose and code

Lab: continued electrical circuit lab

**Step Three**

Lecture: Introduction to plumbing, code issues and history, safety, 3 typical residential systems, sub contractor process handout, general plumbing handout.

Lab: introduction to PEX or copper supply plumbing, cutting, fitting, assembly and testing. All students will solder and test a pipe loop they cut to plan specifications.

**Step Four**

Lecture: Introduction to residential HVAC systems, sub contractors, code issues

Lab: Complete piping exercise, if time allows set up for abs interference pipe cutting and fitting.

Grading criteria  
 attending class lectures,  
 electrical pop quiz  
 electrical circuit lab  
 supply piping assembly  
 exam

1. 50% of your grade will be based on your EFFORT as measured by assigned exercises, group work & attendance. Non-written assignments will be evaluated by the instructor and the student will be informed when they have successfully accomplished a task at the time the work is being done.
2. 50% of your grade is based on your ACHIEVEMENT as measured by homework, quizzes and the final exam. Please refer to the instructor for schedule and due date details. Any changes from the printed outline will be announced in class.

All written work will be graded and returned to student for corrections. When corrections have been made and turned back into the instructor again an S - Satisfactory will be given. Work that is not corrected will receive a U - Unsatisfactory grade. If a student chooses the decimal grade option the percent correct on all of your work will be averaged together and a grade will be given based on the conversion table below. Students that choose the decimal grade option must inform the instructor during the first week of the quarter.

| <u>S/U Grading</u>    | <u>Decimal Grading</u> | <u>Decimal Grading</u><br><u>cont.</u> | <u>Decimal Grading</u><br><u>cont.</u> |
|-----------------------|------------------------|--|--|
| <u>Satisfactory</u> = | 95 - 100% - 4.0(A)     |  |  |
| Greater than          | 94% - 3.9 (A)          | 80% - 3.0 (B)                          | 68% - 1.8 (C-)                         |
| 70%*                  | 93% - 3.8 (A-)         | 79% - 2.9 (B)                          | 67% - 1.7 (C-)                         |
|                       | 92% - 3.7 (A-)         | 78% - 2.8 (B-)                         | 66% - 1.6 (C-)                         |
| <u>Unsatisfactory</u> | 89 - 91% - 3.6 (A-)    | 77% - 2.7 (B-)                         | 65% - 1.5 (C-)                         |
| = Less than           | 90% - 3.5 (A-)         | 76% - 2.6 (B-)                         | 64% - 1.4 (D+)                         |

|      |                 |                |                 |
|------|-----------------|----------------|-----------------|
| 70%* | 89% - 3.4 (B+)  | 75% - 2.5 (B-) | 63% - 1.3 (D+)  |
|      | 88 % - 3.4 (B+) | 74% - 2.4 (C+) | 62% - 1.2 (D+)  |
|      | 87 % - 3.4 (B+) | 73% - 2.3 (C+) | 61% - 1.1 (D)   |
|      | 86% - 3.3 (B+)  | 72% - 2.2 (C+) | 60% - 1.0 (D)   |
|      | 85% - 3.3 (B+)  | 71% - 2.1 (C)  | 59% - 0.9 (D)   |
|      | 84% - 3.2 (B+)  | 70% - 2.0      | 58% - 0.8 (D-)  |
|      | 83% - 3.2 (B+)  | *(C/S)         | 57% - 0.7 - (D) |
|      | 81% - 3.1 (B)   | 69% - 1.9      | 56% & lower-    |
|      |                 | *(C/U)         | 0.0(F)          |

**COLLEGE POLICIES:** (see <http://policies.edcc.edu/academic> for a complete listing)

NOTE: THESE POLICIES ARE INCLUDED BECAUSE CLASSES ARE HELD ON THE EDCC CAMPUS.

1. Grounds for disciplinary action shall include, but not be limited to the following:
  - a. Dishonesty, including cheating or plagiarism.
  - b. Obstruction or disruption of class including the use of cell phones and other electronic devices.
  - c. Unauthorized use of college supplies or equipment.
  - d. Illegal use, possession, or distribution of drugs.
  - e. Use, possession or distribution of alcoholic beverages or other potentially disabling substances like THC.
  - f. Acts or behaviors which discriminate against staff, students or the public on the basis or race, ethnic origin, sex, age, sexual orientation, or disability as described in the college's human rights policies.

**HIGH SCHOOL POLICIES: we will use the MTHS student handbook.**