



Architectural Design and Construction

<https://www.hccs.edu/programs/areas-of-study/construction-industry--manufacturing/heating-air-conditioning--refrigeration/>

HART 1301: Basic Electricity for HVAC | Lecture/Lab | #18767 Spring 2020 | 8 Weeks (1.21.2020 - 3.15.2020)

HYBRID | Central - J.B. Whiteley Rm 104 | F 6:00PM - 9:50PM
3 Credit Hours | 80 hours per semester

Instructor Contact Information

Instructor: C. Pleasant	Office Phone: 713-718-2373
Office: Southeast (EASTSIDE) Campus	Office Hours: By Appointment
HCC Email: cheryl.pleasant@hccs.edu	Office Location: SEPKG 108

Please feel free to contact me concerning any problems that you are experiencing in this course. Your performance in my class is very important to me. I am available to hear the concerns and just to discuss course topics.

Instructor's Preferred Method of Contact

Contact me via email at cheryl.pleasant@hccs.edu.

I will respond to emails within 24 hours Monday through Friday; I will reply to weekend messages on Monday mornings.

What's Exciting About This Course

In this course you will learn about the principles of electricity as required by HVAC, including proper use of test equipment, electrical circuits, and component theory and operation.

My Personal Welcome

Thank you for choosing my class. According to the US Department of Labor, the growing number of sophisticated climate-control systems is expected to increase demand for qualified HVACR technicians. Candidates familiar with computers and electronics, as well as those who have developed troubleshooting skills, will have the best job opportunities.

There are many career and job opportunities in HVAC. The technician may work for a community-based company (residential), in a commercial or industrial setting or for a manufacturer. Our faculty is therefore diverse and each instructor offers a different perspective to prepare you to be successful in the HVAC industry.

Prerequisites and/or Co-Requisites

- ELPT 1315

Canvas Learning Management System

This section will use [Eagle Online Canvas \(https://eagleonline.hccs.edu\)](https://eagleonline.hccs.edu) to supplement in-class assignments, exams, and activities.

When students are able to manage time and assignments in CANVAS, it demonstrates to industry the ability to work with little or no supervision.

HCCS Open Lab locations may be used to access the Internet and Eagle Online Canvas. It is recommended that you **USE FIREFOX OR CHROME AS YOUR BROWSER.**

HCC Online Information and Policies

Here is the link to information about HCC Online classes including the required Online Orientation for all fully online classes: <http://www.hccs.edu/online/>

Scoring Rubrics, Sample Assignments, etc.

Look in Canvas for the scoring rubrics for assignments, samples of class assignments, and other information to assist you in the course. <https://eagleonline.hccs.edu/login/ldap>

Instructional Materials

Textbook Information

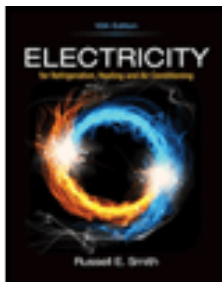


"Core Curriculum: Intro Craft Skills"

(latest edition) by NCCER

Publisher: Pearson

ISBN: 9780134130989



"Electricity for Refrigeration, Heating and Air Conditioning"

(latest edition) by Smith

Publisher: Cengage Learning

ISBN: 9781337399128

Order your book here: [HCC Bookstore](#)

Temporary Free Access to E-Book

N/A

Other Instructional Resources

Publisher's Digital Workbook

N/A

Tutoring

HCC provides free, confidential, and convenient academic support, including writing critiques, to HCC students in an online environment and on campus. Tutoring is provided by HCC personnel in order to ensure that it is contextual and appropriate. Visit the [HCC Tutoring Services](#) website for services provided.

Libraries

The HCC Library System consists of 9 libraries and 6 Electronic Resource Centers (ERCs) that are inviting places to study and collaborate on projects. Librarians are available both at the libraries and online to show you how to locate and use the resources you need. The libraries maintain a large selection of electronic resources as well as collections of books, magazines, newspapers, and audiovisual materials. The portal to all libraries' resources and services is the HCCS library web page at <http://library.hccs.edu>.

Supplementary Instruction

Supplemental Instruction is an academic enrichment and support program that uses peer-assisted study sessions to improve student retention and success in historically difficult courses. Peer Support is provided by students who have already succeeded in completion of the specified course, and who earned a grade of A or B. Find details at <http://www.hccs.edu/resources-for/current-students/supplemental-instruction/>.

Course Overview

In this course you will learn about the principles of electricity as required by HVAC, including proper use of test equipment, electrical circuits, and component theory and operation.

Core Curriculum Objectives (CCOs)

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Program Student Learning Outcomes (PSLOs)

PSLOs can be found at:

<https://www.hccs.edu/programs/areas-of-study/construction-industry--manufacturing/heating-air-conditioning--refrigeration/>

Course Student Learning Outcomes (CSLOs)

In this course, the CSLOs are:

1. Discuss soft skills
2. Explain importance of safety in construction and industrial crafts
3. Demonstrate understanding of basic science
4. Demonstrate understanding of basic electricity
5. Identify and classify construction and electrical drawings
6. Operate electrical measuring instruments
7. Identify components and interpret symbols
8. Identify and interpret circuits

Learning Objectives

In this course, the learning objectives for each CSLO are:

1. Discuss soft skills
 - Recall importance of employability and communication skills
2. Explain importance of safety in construction and industrial crafts

- Recognize and identify safety hazards and practice general and electrical safe work practices
- 3. Demonstrate understanding of basic science
 - Demonstrate knowledge of basic principles of electricity
- 4. Demonstrate understanding of basic electricity
 - Demonstrate understanding of electrical current
- 5. Identify and classify construction and electrical drawings
 - Demonstrate understanding of blueprints and schematics
- 6. Operate electrical measuring instruments
 - Measure voltage, current and resistance with appropriate meters
- 7. Identify components and interpret symbols
 - Apply Ohm's law to perform electrical calculations
- 8. Identify and interpret circuits
 - Examine series and parallel circuits

Student Success

Expect to spend at least twice as many hours per week outside of class as you do in class studying the course content. Additional time will be required for written assignments. The assignments provided will help you use your study hours wisely. Successful completion of this course requires a combination of the following:

- Reading the textbook
- Attending class in person and/or online
- Completing assignments
- Participating in class activities

There is no short cut for success in this course; it requires reading (and probably re-reading) and studying the material using the course objectives as your guide.

Instructor and Student Responsibilities

As an **instructor**, it is my responsibility to:

- Provide the grading scale and detailed grading formula explaining how student grades are to be derived
- Facilitate an effective learning environment through learner-centered instructional techniques
- Provide a description of any special projects or assignments

- Inform students of policies such as attendance, withdrawal, tardiness, and make up
- Provide the course outline and class calendar which will include a description of any special projects or assignments
- Arrange to meet with individual students before and after class as required

As a **student**, it is your responsibility to:

- Attend class in person and/or online
- Participate actively by reviewing course material, interacting with classmates, and responding promptly in your communication with me
- Read and comprehend the textbook
- Complete the required assignments and exams
- Ask for help when there is a question or problem
- Keep copies of all paperwork, including this syllabus, handouts, and all assignments
- Attain a raw score of at least 50% on the departmental final exam
- Be aware of and comply with academic honesty policies in the HCCS Student Handbook

Assignments, Exams, and Activities

Assessments will be administered to determine understanding and comprehension of the course and to determine an appropriate grade. National Center for Construction Education and Research (NCCER) assessments may be administered, as applicable.

Discuss soft skills

In-class discussions

Quizzes/Tests which may include: definitions, matching, multiple choice, true/false, short answer, brief essay

Group and/or individual projects

Various assigned readings from textbooks

Explain importance of safety in construction and industrial crafts

In-class discussions

Quizzes/Tests which may include: definitions, matching, multiple choice, true/false, short answer, brief essay

Group and/or individual projects

Various assigned readings from textbooks

Demonstrate understanding of basic science

In-class discussions

Quizzes/Tests which may include: definitions, matching, multiple choice, true/false, short answer, brief essay

Group and/or individual projects

Various assigned readings from textbooks

Demonstrate understanding of basic electricity

In-class discussions

Quizzes/Tests which may include: definitions, matching, multiple choice, true/false, short answer, brief essay

Group and/or individual projects

Various assigned readings from textbooks

Identify and classify construction and electrical drawings

In-class discussions

Quizzes/Tests which may include: definitions, matching, multiple choice, true/false, short answer, brief essay

Group and/or individual projects

Various assigned readings from textbooks

Operate electrical measuring instruments

In-class discussions

Quizzes/Tests which may include: definitions, matching, multiple choice, true/false, short answer, brief essay

Group and/or individual projects

Various assigned readings from textbooks

Identify components and interpret symbols

In-class discussions

Quizzes/Tests which may include: definitions, matching, multiple choice, true/false, short answer, brief essay

Group and/or individual projects

Various assigned readings from textbooks

Identify and interpret circuits

In-class discussions

Quizzes/Tests which may include: definitions, matching, multiple choice, true/false, short answer, brief essay

Group and/or individual projects

Various assigned readings from textbooks

Grading Formula

Class Participation	220	22%
Quiz (8 x 30)	240	24%
Lab (8 x 30)	240	24%
Midterm Examination	150	15%
Final Examination	150	15%
Total Possible Points	1000	-
Total Percentage	-	100%

Incomplete Policy:

In order to receive a grade of Incomplete (“I”), a student must have completed at least 85% of the work in the course. In all cases, the instructor reserves the right to decline a student’s request to receive a grade of Incomplete.

HCC Grading Scale can be found on this site under Academic Information:
<http://www.hccs.edu/resources-for/current-students/student-handbook/>

Course Calendar

COURSE OUTLINE, CONTENT GOALS AND ACTIVITIES

Week 1

Reading Assignment:

NCCER CORE - *Communications Quick Review (HCC LEARNING WEB)*

NCCER HVAC LEVEL 1 - Introduction to HVAC

Program Orientation

Overview of certificates and degrees

Course policies and expectations (*Attendance, Grading Scale*)

Textbook requirements

Tool list

Classroom and lab safety rules and guidelines

Quiz

Lab

Communications (NCCER CORE)

Week 2

Reading Assignment:

NCCER CORE - Employability Quick Review (HCC LEARNING WEB)

Quiz

Lab

Introduction to HVAC (NCCER HVAC Level 1)

Employability (NCCER CORE)

Week 3

Reading Assignment:

Electricity for Refrigeration, Heating and Air Conditioning (Chapter 1)

Safety in Construction and Industrial Crafts

Importance of safety

Hazard recognition, evaluation and control

Elevated work and fall protection (ladders, stairs and scaffolds)

Struck-by and caught in between

Electrocutions

Personal protective equipment

Other hazards

Quiz

Lab

Week 4

Reading Assignment:

Electricity for Refrigeration, Heating and Air Conditioning (Chapter 12)

Electricity for Refrigeration, Heating and Air Conditioning (Chapter 2)

Basic Science

Properties of matter

Basic physical properties of elements

Basic electron theory

Electrical concepts

Electrical charge

Difference between AC and DC power

Power factor

Magnetic principles and components in electricity (coils, transformer)

Quiz
Lab

Midterm Review
Midterm

Week 5

Reading Assignment:

Electricity for Refrigeration, Heating and Air Conditioning (Chapter 2)

Basic Electricity

Voltage

Amperage

Resistance

Ohm's law

Quiz
Lab

Week 6

Reading Assignment:

Electricity for Refrigeration, Heating and Air Conditioning (Chapter 8)

Conductors

Insulators

Quiz
Lab

Week 7

Reading Assignment:

Electricity for Refrigeration, Heating and Air Conditioning (Chapter 4)

Electrical Measuring Instruments

Identify meters and instruments

Setup and use digital meters

Measurements (voltage, resistance, amperage)

Quiz
Lab

Week 8

Reading Assignment:

NCCER CORE CURRICULUM

Electricity for Refrigeration, Heating and Air Conditioning (Chapter 5)

Components and Symbols

Wiring diagrams

Pictorial diagrams

Schematic (*Ladder*) diagrams

Circuits

Series circuits

Parallel circuits

Complex circuits

Quiz

Lab

Final Review

Final

THE END

Syllabus Modifications

The instructor reserves the right to modify the syllabus at any time during the semester and will promptly notify students in writing, typically by e-mail, of any such changes.

Instructor's Practices and Procedures

Missed Assignments

Makeup assignments are typically not available. Missed assignments are addressed on a case by case basis. Communicating with the instructor is important especially if you will miss a class.

Academic Integrity

Here's the link to the HCC information about academic integrity (Scholastic Dishonesty and Violation of Academic Scholastic Dishonesty and Grievance):

<http://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-procedures/>

Attendance Procedures

The HCC attendance policy should be abided by. Students are encouraged to get information from the syllabus on what will be covered or from a colleague. HCC is concerned about student success. Expect an “early alert” to be issued if there is excessive absenteeism.

Student Conduct

Students are expected to abide by HCC policies at all time. Mutual respect is expected in the classroom.

Instructor’s Course-Specific Information (As Needed)

This section intentionally blank

Electronic Devices

Electronic devices can disrupt the learning environment. Do **not** use electronic devices while class is in session. Breaks are typically provided. In the event of an emergency, please exit the classroom if you must conduct business or tend to a personal matter using an electronic device.

Heating Ventilation and Air Conditioning Program Information

Additional program-specific information can be found at the following:

<http://learning.hccs.edu/programs/heating-ac-refrigeration>

HCC Policies

Here’s the link to the HCC Student Handbook <http://www.hccs.edu/resources-for/current-students/student-handbook/> In it you will find information about the following:

- Academic Information
- Academic Support
- Attendance, Repeating Courses, and Withdrawal
- Career Planning and Job Search
- Childcare
- disAbility Support Services
- Electronic Devices
- Equal Educational Opportunity
- Financial Aid TV (FATV)
- General Student Complaints
- Grade of FX

- Incomplete Grades
- International Student Services
- Health Awareness
- Libraries/Bookstore
- Police Services & Campus Safety
- Student Life at HCC
- Student Rights and Responsibilities
- Student Services
- Testing
- Transfer Planning
- Veteran Services

EGLS³

The EGLS³ ([Evaluation for Greater Learning Student Survey System](#)) will be available for most courses near the end of the term until finals start. This brief survey will give invaluable information to your faculty about their teaching. Results are anonymous and will be available to faculty and division chairs after the end of the term.

EGLS³ surveys are only available for the Fall and Spring semesters. -EGLS³ surveys are not offered during the Summer semester due to logistical constraints.

<http://www.hccs.edu/resources-for/current-students/egls3-evaluate-your-professors/>

Campus Carry Link

Here's the link to the HCC information about Campus Carry:

<http://www.hccs.edu/departments/police/campus-carry/>

HCC Email Policy

When communicating via email, HCC requires students to communicate only through the HCC email system to protect your privacy. If you have not activated your HCC student email account, you can go [to HCC Eagle ID](#) and activate it now. You may also use Canvas Inbox to communicate.

Housing and Food Assistance for Students

Any student who faces challenges securing their foods or housing and believes this may affect their performance in the course is urged to contact the Dean of Students at their college for support. Furthermore, please notify the professor if you are comfortable in doing so.

This will enable HCC to provide any resources that HCC may possess.

Office of Institutional Equity

Use the link below to access the HCC Office of Institutional Equity, Inclusion, and Engagement (<http://www.hccs.edu/departments/institutional-equity/>)

disAbility Services

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including long and short term conditions, mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible in order to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning environments consistent with federal and state law. For more information, please go to <http://www.hccs.edu/support-services/disability-services/>

Title IX

Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual's fundamental rights and personal dignity. Title IX prohibits discrimination on the basis of sex-including pregnancy and parental status in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:

David Cross
Director EEO/Compliance
Office of Institutional Equity & Diversity
3100 Main
(713) 718-8271
Houston, TX 77266-7517 or Institutional.Equity@hccs.edu
<http://www.hccs.edu/departments/institutional-equity/title-ix-know-your-rights/>

Office of the Dean of Students

Contact the office of the Dean of Students to seek assistance in determining the correct complaint procedure to follow or to identify the appropriate academic dean or supervisor for informal resolution of complaints.

<https://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-complaints/speak-with-the-dean-of-students/>

Department Chair Contact Information

Aurelio Aguilar
aurelio.aguilar@hccs.edu