



Course Syllabus

Basic Electricity for HVAC

HART 1301

Semester with Course Reference Number (CRN)	FALL 2018 CRN 14842
Instructor contact information (phone number and email address)	CHERYL PLEASANT 713.718.2373 CHERYL.PLEASANT@HCCS.EDU
Office Location and Hours	CENTRAL COLLEGE – SOUTH CAMPUS T TH 8:00AM – 9:30AM (OR BY APPOINTMENT)
Course Location/Times	WORKFORCE BUILDING II SOUTH CAMPUS CLASSROOM 130 M W 3:30PM - 5:50PM
Course Semester Credit Hours (SCH) (lecture, lab) If applicable	Credit Hours: 3 Lecture Hours: 2 Laboratory Hours: 3 External Hours:
Total Course Contact Hours	80.00
Course Length (number of weeks)	8 WEEKS
Type of Instruction	Lecture/Lab
Course Description:	Principles of electricity as required by HVAC, including proper use of test equipment, electrical circuits, and component theory and operation.
Course Prerequisite(s)	PREREQUISITE(S): <ul style="list-style-type: none">• TECM 1301 with a minimum grade of D or better or• ELPT 1315 with a minimum grade of D or better CO-REQUISITE(S): <ul style="list-style-type: none">• TECM 1301 with a minimum grade of D or better or• ELPT 1315 with a minimum grade of D or better FREQUENT REQUISITES <ul style="list-style-type: none">• MATH 0306 (Basic Math Pre-Algebra)• INRW 0410
Academic Discipline/CTE Program Learning Outcomes	<ol style="list-style-type: none">1. Demonstrate knowledge of safety rules and regulations.2. Demonstrate the proper selection, use, and maintenance of hand and power tools and measuring instruments used in A/C and Refrigeration.3. Maintain A/C and Refrigeration equipment.4. Service/repair A/C and Refrigeration equipment.

Course Student Learning Outcomes (SLO): 4 to 7

5. Troubleshoot A/C and Refrigeration equipment.
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 (Numbering system should be linked to SLO - e.g., 1.1, 1.2, 1.3, etc.)

- Discuss soft skills
1. Recall importance of employability and communication skills
- Explain importance of safety in construction and industrial crafts
1. Recognize and identify safety hazards and practice general and electrical safe work practices
- Demonstrate understanding of basic science
1. Demonstrate knowledge of basic principles of electricity
- Demonstrate understanding of basic electricity
1. Demonstrate understanding of electrical current
- Identify and classify construction and electrical drawings
1. Demonstrate understanding of blueprints and schematics
- Operate electrical measuring instruments
1. Measure voltage, current and resistance with appropriate meters
- Identify components and interpret symbols
1. Apply Ohm's law to perform electrical calculations
- Identify and interpret circuits
1. Examine series and parallel circuits

SCANS and/or Core Curriculum Competencies: If applicable

- SCANS**
- Discuss soft skills**
- Explain importance of safety in construction and industrial crafts**
- Demonstrate understanding of basic science**
- Demonstrate understanding of basic electricity**
- Identify and classify construction and electrical drawings**
- Operate electrical measuring instruments**
- Identify components and interpret symbols**
- Identify and interpret circuits**

Instructional Methods

Web-enhanced (49% or less)
Face to Face

Student Assignments

- Discuss soft skills**
- Explain importance of safety in construction and industrial crafts**
- Demonstrate understanding of basic science**
- Demonstrate understanding of basic electricity**
- Identify and classify construction and electrical drawings**
- Operate electrical measuring instruments**
- Identify components and interpret symbols**
- Identify and interpret circuits**

Student Assessment(s)

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 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



As your 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 class activities, discussions, and lectures
- 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

To be successful in this class, it is the student's responsibility to:

- Attend class and participate in class discussions and activities
- Read and comprehend the textbook
- Complete the required assignments and exams (*including midterm and final*):
- Ask for help when there is a question or problem
- Keep copies of all paperwork, including this syllabus, handouts and all assignments

COURSE OUTLINE, CONTENT GOALS AND ACTIVITIES

Week 1

Reading Assignment:

NCCER HVAC LEVEL 1

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

Introduction to HVAC (*NCCER HVAC Level 1*)

Week 2

Reading Assignment:

NCCER CORE CURRICULUM

NCCER CORE - Communications Quick Review (HCC LEARNING WEB)

NCCER CORE - Employability Quick Review (HCC LEARNING WEB)

Quiz

Lab

Communications (*NCCER CORE*)

Employability (*NCCER CORE*)

Week 3

Reading Assignment:

NCCER CORE CURRICULUM

NCCER CORE-Safety (CANVAS or HCC LEARNING WEB)

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

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 – Week 6

Reading Assignment:

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

Basic Electricity

Voltage

Amperage

Resistance

Ohm's law

Reading Assignment:

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

Conductors

Insulators

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*)

Reading Assignment:

NCCER CORE – Hand Tools Quick Review (HCC LEARNING WEB)

NCCER CORE – Power Tools Quick Review (HCC LEARNING WEB)

Quiz

Lab

Week 7 – Week 8

Reading Assignment:

NCCER CORE CURRICULUM

NCCER CORE-Construction Drawings (HCC LEARNING WEB)

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

Construction Drawings

Plans, specifications and blueprints

Components and Symbols

Wiring diagrams

Pictorial diagrams

Schematic (*Ladder*) diagrams

Circuits

Series circuits

Parallel circuits

Complex circuits

Quiz

Lab

Final Review

Final

THE END

**Program/Discipline
Requirements:
(if applicable)**

Student is required to bring to class all necessary tools, and dress according to lab safety requirements. Student must bring textbooks, notebooks, and other required supplies.

HCC Grading Scale:

A = 100- 90	4 points per semester hour
B = 89 - 80:	3 points per semester hour
C = 79 - 70:	2 points per semester hour
D = 69 - 60:	1 point per semester hour
59 and below = F	0 points per semester hour
FX (Failure due to non-attendance)	0 points per semester hour
IP (In Progress)	0 points per semester hour
W (Withdrawn)	0 points per semester hour

I (Incomplete)	0 points per semester hour
AUD (Audit)	0 points per semester hour

IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses.

FINAL GRADE OF FX: Students who stop attending class and do not withdraw themselves prior to the withdrawal deadline may either be dropped by their professor for excessive absences or be assigned the final grade of "FX" at the end of the semester. Students who stop attending classes will receive a grade of "FX", compared to an earned grade of "F" which is due to poor performance. Logging into a DE course without active participation is seen as non-attending. Please note that HCC will not disperse financial aid funding for students who have never attended class.

Students who receive financial aid but fail to attend class will be reported to the Department of Education and may have to pay back their aid. A grade of "FX" is treated exactly the same as a grade of "F" in terms of GPA, probation, suspension, and satisfactory academic progress.

To compute grade point average (GPA), divide the total grade points by the total number of semester hours attempted. The grades "IP," "COM" and "I" do not affect GPA.

Health Sciences Programs Grading Scales may differ from the approved HCC Grading Scale. For Health Sciences Programs Grading Scales, see the "Program Discipline Requirements" section of the Program's syllabi.

Instructor Grading Criteria	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%

Instructional Materials (OPTIONAL) ELECTRICITY FOR REFRIGERATION, HEATING, AND AIR CONDITIONING Russell E. Smith Athens Technical College, Athens 9th Edition ISBN-13: 978-1285179988 ISBN-10: 1285179986 and

(OPTIONAL) CORE CURRICULUM TRAINEE GUIDE NCCER 5th Edition ISBN-10: 0-13-413098-7 or

(OPTIONAL) CAREER AND TECHNICAL WORKBOOK(S) EEI Publishing www.certifyin7.org/resources.html

Student Services Policies <http://www.hccs.edu/district/about-us/procedures/student-rights-policies--procedures/>

HCC Policy Statement: Discrimination and Accommodations 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 Houston, TX 77266-7517 or Institutional.Equity@hccs.edu

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including 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/district/students/disability-services/>

**HCC Policy Statement:
*Sexual Misconduct***

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

**EGLS₃ -- Evaluation for
Greater Learning Student
Survey System**

At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time near the end of the term, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and department chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.

HCC Online and/or Continuing Education Policies

Access DE Policies on their Web site:

All students are responsible for reading and understanding the HCC Online Student Handbook, which contains policies, information about conduct, and other important information. For the HCC Online Student Handbook click on the link below or go to the HCC Online page on the HCC website.

The HCC Online Student Handbook contains policies and procedures unique to the online student. Students should have reviewed the handbook as part of the mandatory orientation. It is the student's responsibility to be familiar with the handbook's contents. The handbook contains valuable information, answers, and resources, such as HCC Online contacts, policies and procedures (how to drop, attendance requirements, etc.), student services (ADA, financial aid, degree planning, etc.), course information, testing procedures, technical support, and academic calendars. Refer to the HCC Online Student Handbook by visiting this link:

<http://www.hccs.edu/media/houston-community-college/distance-education/student-services/HCC-Online-Student-Handbook.pdf>

Access CE Policies on their Web site:

<http://www.hccs.edu/continuing-education/>