



AC Control Principles

HART-1403

Full Term Fall 2016 Section 003.31119 4-3-3 Credits 08/22/2016 to 12/10/2016 Modified 08/16/2016

Contact Information

Please contact me by email.

Assistant Professor: Anthony Thomas

Email: athomas2@alamo.edu

Office: A157

Phone: 210-486-7242

Materials

Tool list will be provided.

Electricity For Refrigeration, Heating, and Air Conditioning 9th

Author: Russell E. Smith

Edition: 9th ED

ISBN: 978-1-2851-7998-8

Book is required for class.

Description

A basic study of HVAC and refrigeration controls; troubleshooting of control components; emphasis on use of wiring diagrams to analyze high and low voltage circuits; a review of Ohm's law as applied to air conditioning controls and circuits.

Prerequisite(s)

Objectives

During this course you will be engaged in addressing the following course objectives:

1. Demonstrate and practice safe working habits in the shop area.
2. Demonstrate and practice electrical safety while working in the lab area.
3. Draw the different types of electrical circuits.
4. Demonstrate and practice the proper use and care of hand tools and test equipment.
5. Develop skills in air conditioning and refrigeration controls.
6. Demonstrate an understanding of control theory and refrigeration systems.
7. Select and use the proper tools.
8. Troubleshoot control failure and related mechanical problems.
9. Read and interpret wiring diagrams and schematics used in the HVACR industry.
10. This course will develop the following SCANS skills and competencies: Manages time, participates as member of a team, exercises leadership, negotiates to arrive at a decision, acquires and evaluates information, organizes and maintains information, interprets and communicates information, understands systems, monitors and corrects system performance, maintains and troubleshoots technology, reading, writing, arithmetic, mathematics, listening, speaking, creative thinking, decision making,

problem solving, mental visualization, knowing how to learn, responsibility, self-esteem, sociability, self-management, integrity/honesty.

11. A “critical thinking” component tailored to the course content and reflecting the college’s QEP initiative.
12. Demonstrate and practice the proper use and care of computers.

Outcomes

- 1 Test, repair, and/or replace HVAC-related electrical and control components, wiring and equipment.
- 2 Read, draw, and interpret high and low voltage control circuits.

Evaluation

Criteria

Student will be graded on each of the competencies listed on the course syllabus and the assigned tasks as they are completed. The total points will be calculated into an overall grade. There will be a Mid-term and Final Examination given in each class.

<i>Quiz (quiz's)</i>	33%
<i>LAB PERFORMANCE (Attendance, projects)</i>	34%
<i>EXAMINATION (Mid-term and final; written and practical)</i>	<u>33%</u>

A = 90-100

B = 80 – 89

C = 75 – 79

D= 66-74

F=65&below

Course Policies

Required Items

a.Text,tools and safety gear are required for this class

1. Students who do not possess the required safety gear and tools will not be able to attend lab and receive a 0 for the day. (Tools, Safety glasses, Proper shoes, safety gloves & and proper clothing)

Attendance

Regular and punctual class and laboratory attendance, day and/or evening, is required. Tardiness is a form of absenteeism and is a distraction to the class, unless I am informed in advance you will be counted absent after the first 30 minutes after class begins.

Being tardy four times within a three week period will result in an absence.

A student who is absent for any reason will be allowed to do makeup work at the discretion of the instructor. A student will be held responsible for lecture materials when covered on subsequent examinations. An excused absence will apply only to a student representing the school in an official capacity approved by the administration. Absences of a student are recorded from the official date of enrollment in the class.

Absences are considered excessive when more than 12.5 percent of the total contact hours of instruction in a semester, including lecture and lab, are missed. For example, in a three-credit-hour lecture class, students may be dropped after more than six contact hours of absences. In a four-credit-hour lecture/lab class, students may be dropped after more than eight contact hours of absences. Absences are counted regardless of whether they occur consecutively

Computers

1. Absolutely no food or drinks are allowed around computers.

2. Computers are for school use only! No computers will be used for surfing the web or playing video games and any inappropriate use will be considered means for withdrawal from class.

Cell Phone

Cell phone use is not permitted in class.

All phones will be set to vibrate or silent if you phone rings you will be given a warning if it rings twice you will be asked to leave and given a 0 for the day.

If a call must be made step outside and take the call.

No texting or listening to music while in lecture or lab this is considered very disrespectful and a distraction. If you are texting or listening to music you are not considered in class and will be counted absent.

Behavior

Disruptive behavior will not be tolerated! Disruptive behavior includes talking out loud or interrupting a lecture, being Confrontational with the instructor or another student, making racist comments, sexual harassment, inappropriate comments, cheating and offensive language.

Tool list

ST. PHILIP'S COLLEGE

AIR CONDITIONING & REFRIGERATION PROGRAM

TOOL LIST

All students enrolled in these courses are required to furnish the following basic set of tools. Students who do not have these required tools by the 12th class day may receive a failing grade for each day that they cannot complete their work assignments due to not having the proper tools.

COMMON TOOLS REQUIRED FOR HART 1403, HART 1407, AND HART 2438

1. SAFETY GLASSES
2. WORK GLOVES
3. BLADED 4" SCREWDRIVER
4. PHILLIPS 4" SCREWDRIVER, #2 PT.
5. 4" NUT DRIVER 1/4"
6. 4" NUT DRIVER 5/16"
7. 8" SLIP-JOINT PLIERS
8. 8" VISE-GRIP PLIERS
9. 8" LONG NOSE PLIERS
10. 8" ADJUSTABLE WRENCH
11. 8" DIAGONAL-CUTTING PLIERS
12. WIRE STRIPPERS
13. FUSE PULLERS
14. VOLT-OHM METER
15. 20" TOOL BOX OR EQUIVALENT TOOL BAG
16. CLAMP-ON AMMETER
17. 25' MEASURING TAPE
18. FLASHLIGHT
19. BLADED POCKET SCREWDRIVER

20. PHILLIPS POCKET SCREWDRIVER

ADDITIONAL TOOLS FOR THE FOLLOWING CLASSES

HART 1403 HART 1407 HART 2438

1. SHOP LIGHT W/15' CORD
1. TUBING CUTTER
1. 10" ADJUSTABLE WRENCH
2. LINEMAN PLIERS
2. FLARING BLOCK
2. BLADED 6" SCREWDRIVER
3. FLARING TOOL
3. PHILLIPS 6" SCREWDRIVER
4. SWAGING TOOLS
4. 6" NUT DRIVER 1/4"
5. HAMMER
5. 6" NUT DRIVER 5/16"
6. WIRE BRUSHES 3/8"
6. VALVE STEM SERVICE WRENCH 1/2", 5/8", 3/4", 7/8"
7. POCKET THERMOMETER
7. HACK SAW
8. HEX KEY SET

Schedule

When	Topic	Notes
		<p>Introduction to Course</p> <p>CH.1 Electrical safety</p> <p>A. Lecture: Electrical safety</p> <p>B. Reading Assignment:</p> <p>ch.2 Basic Electricity</p> <p>A. Lecture: Basic Electricity</p> <p>B. Reading Assignment:</p> <p>C. Lab</p> <p>CH.3 & 4 Electrical Circuits, Electric Meters</p> <p>A. Lecture: Electrical Circuits</p> <p>B. Reading Assignment:</p> <p>C. Lab:</p> <p>CH.5 Symbols, and Circuitry of Air Conditioning Wiring Diagrams</p> <p>A. Lecture: Electric Meters</p> <p>B. Reading Assignment:</p> <p>C. Lab:</p>

When	Topic	Mid-Term Exam Notes
		<p>CH.6 Reading Schematic Wiring Diagrams</p> <p>A. Lecture: Reading Schematic Diagrams</p> <p>B. Reading Assignment:</p> <p>C. Lab:</p> <p>CH.7 Alternating Current, Power Distribution, and Voltage Systems</p> <p>A. Lecture: Alternating Current, Power Distribution, and Voltage Systems</p> <p>B. Reading Assignment:</p> <p>C. Lab:</p> <p>CH.8 Installations of Heating, Cooling, and Refrigeration Systems</p> <p>A. Lecture: Installations of Heating, Cooling, and Refrigeration Systems</p> <p>B. Reading Assignment:</p> <p>C Lab:</p> <p>Final Exam</p>
Lecture & lab 9:00 am-11:50 pm RM. A132	Control Principles	All tools and and text are required for class.

Institutional Policies

STUDENT RESPONSIBILITIES:

A. Attendance:

Effective Spring Term 2010, student absences will be recorded from the first day the class meets. Regular and punctual attendance in all classes and laboratories, day and evening, is required. Students who are absent for any reason should always consult with their instructors. Course syllabi must provide specific information regarding attendance, including, for courses involving the internet, online activity that constitutes "attendance." Also, both tardiness and early departure from class may be considered forms of absenteeism. In all cases, students will be held responsible for completion of course requirements covered in their absence.

Additionally, it is the student's responsibility to drop a course for nonattendance. Course instructors establish policy with regard to attendance in their respective syllabi and may drop a student for excessive absences. Absences are considered excessive when more than 12.5 percent of the total contact hours of instruction in a semester, including lecture and lab, are missed. For example, in a three-credit-hour lecture class, students may be dropped after more than six contact hours of absences. In a four-credit-hour lecture/lab class, students may be dropped after more than eight contact hours of absences. Absences are counted regardless of whether they occur consecutively.

In special programs with additional accreditation or certification standards, additional attendance requirements may be enforced but faculty must clearly explain these policies in their syllabi. Students who stop attending class for any reason should contact the instructor and the college registrar to officially withdraw from the class. Students may be required to consult with an advisor or designee before dropping.

Failure to officially withdraw may result in a failing grade for the course. It is the student's responsibility to withdraw officially from a class by submitting a completed Withdrawal Form to the Admissions and Records Office.

B. Early Alert and Intervention

Alamo College instructors care about students' success in every course. During the semester, students may receive alert emails through the ACES account regarding their progress and ultimate success in a course. Upon receipt of the email, students are to contact the course instructor to discuss specific tasks or actions to improve success in this course. In addition, students will also need to meet with their Certified Advisor. Discussions with faculty and Certified Advisors allows the student to identify actions that will help to successfully complete course requirements at Alamo Colleges.

C. Student Responsibility for Success (Alamo Colleges Policy F.6.2):

As members of the Alamo Colleges learning community, students, faculty, staff and administrators all share the responsibility to create an atmosphere where knowledge, integrity, truth, and academic honesty are valued and expected. A clear acknowledgment of the mutual obligations of all members of the academic community emphasizes this implicit partnership in fostering the conditions necessary for student success.

In this relationship, the Alamo Colleges provides institutional policies, procedures, and opportunities to facilitate student learning that encourage interaction, involvement and responsible participation. Inherent in the academic climate is the expectation that students will assume responsibility for contributing to their own development and learning. Academic success is directly tied to the effort students put into their studies, the degree to which they interact with faculty and peers, and the extent to which students integrate into the campus life.

1. Engagement

1. Create connections and build relationships with faculty, staff and students (visit during office hours, join clubs and organizations, participate in student activities, etc.);
2. Stay informed of policies, procedures, deadlines and events for academic and co-curricular activities;
3. Complete all requirements for admission, registration, and payment by deadlines;
4. Apply for financial assistance, if needed, complying with all federal, state and local regulations and procedures;
5. Meet all federal, state and local health care regulations.

2. Communication

1. Seek guidance from faculty, advisors or counselors for questions and concerns in regards to degree plans, major selection, academic status, grades, and issues impacting college success;
2. Develop a peer support system to identify student contacts for questions, group assignments, etc. regarding academic and co-curricular activities;
3. Communicate with College personnel promptly regarding academic or co-curricular concerns and assistance requests;
4. Carefully consider the information provided by College personnel and make decisions using that information;
5. Check the Alamo Colleges' Web Services regularly for emails, holds, student records, financial aid status and announcements;
6. Submit disability documentation if seeking services and request academic accommodations in advance of each semester.

3. Academic Success

1. Complete courses with passing grades and maintain good academic standing (2.0 GPA) status;
2. Read and follow all syllabi;
3. Purchase textbooks and required supplies in a timely manner;
4. Attend classes regularly and on time, with as few absences, late arrivals, and early exits as possible;
5. Arrive to class with all needed materials and completed assignments for that class period;
6. Be attentive in class and actively participate as appropriate;
7. Devote sufficient time for studying;
8. Ensure integrity in all aspects of academic and career development;
9. Accurately represent one's own work and that of others used in creating academic assignments. Use information ethically and exercise appropriate caution to avoid plagiarism on all assignments;
10. Notify faculty in advance or as soon as possible about absences and provide documentation as appropriate;
11. Consult faculty members in advance when unable to complete projects, assignments, or take examinations as scheduled.

4. Self-Responsibility and Responsibility to Others

1. Maintain accurate and complete degree/certificate major selection and contact information including name, address, phone number and emergency contact;
2. Balance personal obligations and educational pursuits. Work with a counselor / advisor to design a realistic schedule that dedicates adequate effort to be successful in college studies;
3. Know and follow the regulations and guidelines outlined in the Student Code of Conduct and Student Handbook;
4. Maintain respectful and appropriate behavior within and outside the classroom;
5. Ask for help when needed. Use all available resources and facilities provided by the College to enhance the learning experience;
6. Attend scheduled advising sessions, tutorials, and other appointments. Cancel or reschedule only with good reasons as early as possible;
7. Arrive prepared for tutorial sessions, bringing all needed materials (books, syllabi, rough drafts, calculators, assignment sheets, etc.).

D. Textbook Availability

A student of this institution is not under any obligation to purchase a textbook from a university-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.

COLLEGE REQUIREMENTS:

While other exams are given at the discretion of the instructor, a final assessment is given at the end of each semester for each course. The Final Exam Schedule changes with each term and differs from normal class meeting dates and times. See the Final Exam Schedule in the Catalog/Schedule of Classes in the left hand navigation bar.

A student who must be absent from a final evaluation should petition that instructor for permission to postpone the evaluation. A student absent without permission from a final evaluation is graded "0" on the exam.

Incomplete Grades. The conditional grade of "I" may be issued to a student having a passing average on all completed coursework but for a justified reason, such as illness or death in the family or by providential hindrance, has been prevented from taking the final examination or completing other required coursework. The "I" becomes an "F" in one hundred twenty (120) calendar days from the end of the term unless the student completes the balance of the coursework with a performance grade of "D" or higher. Re-enrollment in the course will not resolve the "I." The student and faculty must fill out an Incomplete Contract, clearly defining the work remaining to be finished.

College Policies

St. Philip's College Mission Statement

St. Philip's College, founded in 1898, is a comprehensive public community college whose mission is to empower our diverse student population through personal educational growth, ethical decision-making, career readiness, and community leadership. As a Historically Black College and Hispanic Serving Institution, St. Philip's College is a vital facet of the community, responding to the needs of a population rich in ethnic, cultural, and socio-economic diversity. St. Philip's College creates an environment fostering excellence in academic and technical achievement while expanding its commitment to opportunity and access.

The college fulfills its mission by offering:

- 1) General courses in arts and sciences leading to an associate degree.
- 2) Transfer education for students desiring to attend senior institutions.
- 3) Developmental courses that improve the basic skills of students whose academic foundations require strengthening.
- 4) Applied Science and technical programs leading to an associate degree or certificate designed to prepare students for employment and/or to update crucial skills.
- 5) Workforce and Career development training programs for business, industry and government.

- 6) Continuing education programs for occupational and educational enrichment or certification.
- 7) Counseling and guidance designed to assist students in achieving their educational and professional goals.
- 8) Educational support services including library services, tutoring, open use computer labs and writing center.
- 9) Services and appropriate accommodations for special populations, to include adult literacy and distance education.
- 10) Quality social, cultural, and intellectual enrichment experiences for the community.
- 11) Opportunities for participation in community service and economic development projects.

St. Philip's College Quality Enhancement Plan: Ethical Decision Making

St. Philip's College is committed to quality education, as such the focus of the 2016 Quality Enhancement Plan is ethical decision-making which is the ability to connect values and choices to actions and consequences.

QEP Student Learning Outcomes:

- Values: Students gain skills to assess their own values.
- Ethical Issues: Students identify and are knowledgeable of ethical issues.
- Perspectives: Students analyze various ethical perspectives.

For more information on the Quality Enhancement Plan,

click [HERE](https://www.alamo.edu/spc/qep/) <https://www.alamo.edu/spc/qep/>



Policies for St. Philip's College:

A. All of the Alamo Colleges are tobacco free.

B. Alamo Colleges DPS Emergency Phone Numbers:

Emergency Phone (210) 485-0911

General Phone (210) 485-0099

Weather Phone (210) 485-0189 (For information on college closures)

C. Disability Access Statement – In accordance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, it is the responsibility of the student to self-identify with the campus Disability Support Services office. Only those students with appropriate documentation will receive a letter of accommodation from the Disability Support Services office. Instructors are required to follow only those accommodation and/or services outlined in the letter of accommodation. For further information, please contact the Disability Support Services office at (210) 486-2295 / (210) 486-2199 or SWC (210) 486-7175 or visit the office located:

MLK Campus – Located at the Sutton Learning Center, Ste. 102

SWC – Located in the LIFEspace office, Bldg. 1, A-135

Web - <http://www.alamo.edu/spc/disabilityservices/>

If you have specific needs, please discuss them privately with your instructor.

D. Mandatory Student Training for Online Classes:

***Note** If you are new to online classes, it is MANDATORY to take the Orientation to Online Learning course, OLRN 0001, CRN #18893 or 20359. This course familiarizes students with navigating through the online system for a successful start. Register for the free, self-paced OLRN course the same way as any other course. See www.alamo.edu/spc/distance-learning or call (210) 486-2239 for more information*