

HART 2445 AC System Design

Please Note: Due to extenuating circumstances, including public health issues, course and testing delivery methods, instructional schedules, housing contracts, campus procedures and/or operating hours may be altered, interrupted and/or ceased for a limited or extended period of time. Such changes will be posted on the College website.

GRAYSON COUNTY COLLEGE Course Syllabus

Professor Contact Information
James Popplewell

Office: (903)463-8713 (call for appointment)
Email: popplewellj@grayson.edu
Hours: Mon-Thurs 7:30 am-10:00 pm

Course Pre-requisites: YES

HART 1401-Electricity Principles for HVAC and HART 1407-Refrigeration Principles 1st
8 Weeks

Course Description

HART 2445. Air Conditioning Systems Design. (4-1-4). A study of the properties of air and results of cooling, heating, humidifying or dehumidifying; heat gain and heat loss calculations including equipment selection and balancing the air system. The student will calculate heat loss and heat gain; design a complete duct system; size heating and cooling equipment of the structure; perform a load calculation using Manual J.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

1. Identify the major components of a compression type refrigeration system.
2. Define terms related to the HVAC/R industry.
3. Calculate R-factor and heat transfer multipliers.
4. Demonstrate an understanding of proper use of the sling psychrometer.
5. Demonstrate an understanding of proper use of psychrometric charts.

6. Test temperatures.
7. Test moisture indicators.
8. Test humidity, measure dry bulb, wet bulb, and dew point.
9. Estimate heating and cooling loads.
10. Design a basic air distribution system.
11. Demonstrate an understanding of the business community.

Required Textbooks (ISBN # included) and Materials

(1) Psychrometric chart 794-018

(3) J-8AE Edition Worksheet

(1) Refrigeration & Air Conditioning Technology (w/Lab Man. & 24-month Access Cards) 8th Edition ISBN-13: 9781305579804

(1) Manual JAE: Residential Load Calculations Abridged Ed Edition: 8th ISBN: 9781892765260

(3) J-1 Edition Worksheet

Fine point dry erase marker, eraser, pen/pencil, clear plastic ruler, and basic calculator

Outline of Topics Covered

- Introduction of fundamental concepts
- HVAC systems concepts
- Psychrometrics
- Human comfort
- Heat transfer
- Heating load
- Ventilation (Infiltration/Ex-filtration)
- Solar radiation
- Cooling load
- Fan/duct design
- Sustainability
- Heat exchangers
- Exams

Required Assignments & Academic Calendar

Just in case of inclement weather, emergency closings, or other unforeseen disruptions to scheduled classes, the student must log onto their CANVAS accounts for directions on where or how to continue their coursework.

Methods of Evaluation

More than 15 minutes late the student will be counted absent. At four absents the student's overall grade WILL be lowered by one letter grade and a conference with the Program Director will be required before the student is allowed to continue. More than four classes missed the student will be considered to have missed the maximum allowable hours to meet the minimum standards for the course and may be required to retake the course.

1. Quizzes and written exams both online and in class.
2. Homework online and classroom exercises.
3. Student participation in classroom and online discussions.
4. Attendance

Grading Categories Percentage

More than 15 minutes late the student will be counted absent. At four absents the student's overall grade WILL be lowered by one letter grade and a conference with the Program Director will be required before the student is allowed to continue. More than four classes missed the student will be considered to have missed the maximum allowable hours to meet the minimum standards for the course and may be required to retake the course.

Quizzes and Exams 50%

Homework and class exercises including Computer lab 25%

Drawing and Calculations Project 5%

Attendance/Tardy = (15%)

Name:		Range:
A	100%	to 94%
B	< 94%	to 84%
C	< 84%	to 74%
D	< 74%	to 64%
F	< 64%	to 0%

Late work will not be accepted after the due date. It is the student's responsibility to ensure all work, discussions, lab performances are completed on time and given to the instructor before the due date/time. Online work will not be accepted late. Online discussions are required, dated, and timed. They will not be reopened.

Quizzes & Tests

Exams & Quizzes will be either online, in class or both which will include textbook reading, class notes, and computer learning methods.

Methods of Instruction

Methods of instruction include lectures, online homework and discussions, classroom discussions, demonstrations, student performances, lab assignments, and research.

The student is required to read text assignments, perform applied arithmetic and mathematical operations, listen and participate in discussions in class.

Instructional aids include related labs, slide presentations, computer systems, multimedia instructional packages, and product cutaways.

Course & Instructor Policies

Students are prohibited from bringing food and drinks into the computer lab.

Students are expected to maintain classroom decorum that includes respect for other students and the instructor, prompt and regular attendance, and an attitude that seeks to take full advantage of the educational opportunity.

Each student must have a current textbook or E-Book as required in the course. The classroom instructor will provide text requirements during the first-class period orientation.

Each student must obtain a personal chart, marker, eraser, ruler, pen/pencil, calculator, and software as required in the course.

Students will not be allowed to participate in lab functions without their manual.

Student cell phones are prohibited during lecture and lab computer times. Students who are seen using their cell phones during these times will be asked to leave and will be counted absent for the day.

Due to the hazardous nature of your career training, safety is a priority. Horseplay and any conduct that might jeopardize your safety or others around you are prohibited.

Grayson County College has policies governing possession and use of narcotics, alcohol, and hallucinatory drugs. These policies will be strictly enforced. Non-compliance with the above-listed policies will be grounds for administrative withdrawal from the HART program.

Class Attendance Academic success is closely associated with regular classroom attendance and course participation. All successful students, whether on campus or online, are expected to be highly self-motivated. All students are required to participate in courses regularly and are obliged to participate in class activities and complete and submit assignments following their professors' instructions.

More than 15 minutes late the student will be counted absent. At four absents the student's overall grade WILL be lowered by one letter grade and a conference with the Program Director will be required before the student is allowed to continue. More than

four classes missed the student will be considered to have missed the maximum allowable hours to meet the minimum standards for the course and may be required to retake the course.

Responsibility for work missed because of illness or school business is placed upon the student and acceptance of late work is at the discretion of the instructor. Late work will not be accepted. If you know you will not be present when an assignment is due it is the student's responsibility to complete the work before its due date. Students who fail to turn in their assignments or complete quizzes or exams on-time will be given a zero for missed work.

In accordance with the College's Developmental Education Plan, students withdrawing from their only developmental course may be withdrawn from all academic courses. In addition, students' eligibility to receive financial aid or live in a College dormitory can be affected by withdrawal from courses. When administrative withdrawal occurs, any tuition refund would be made in accordance with state regulations. Withdrawal from Class The administration of this institution has set deadlines for withdrawal from any college-level courses. These dates and times are published in that semester's schedule of classes. Administrative procedures must be followed. It is the student's responsibility to handle student-initiated withdrawal requirements from any class. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled (see GCC College Catalog for details).

COURSE ATTENDANCE AND TARDIES

15% of a student's overall grade will be lowered once 3 absences are reached. Upon reaching the fourth absence the student overall grade will be an "F", at this point the student has missed approximately 25% or more of the course. The student will be required to retake the course.

Quizzes & Tests

There are "NO" retaking of missed exams.

Methods of Instruction

Methods of instruction include lecture, discussion, demonstration, student performance, and research.

The student is required to read online textbook assignments, perform applied arithmetic and mathematical operations, listen, participate, and write notes. Student learning increases when the student inner acts during classroom discussions.

Instructional aids include related lab equipment, presentations, transparencies, computer systems, multimedia instructional packages, and product cutaways.

Course & Instructor Policies

Students are expected to maintain classroom decorum that includes respect for other students and the instructor, prompt and regular attendance, and an attitude that seeks to take full advantage of the educational opportunity. Each student must have a current textbook or E-Book as required in the course. The classroom instructor will provide text requirements during the first class period orientation. Each student must obtain personal hand tools as required in the course. The classroom instructor will provide tool lists and obtainment dates during the first class period orientation.

Students will not be allowed to participate in lab functions without personal hand tools. Student cell phones will not be used by students during lectures, no exception! Please program all pagers and cell phones to the "silent" mode and put away during class lecture periods.

Due to the hazardous nature of your career training, safety is a priority. Horseplay and any conduct that might jeopardize your safety or others around you are prohibited. When using torches, soldering, sawing, filing, using the hammer, etc., gloves and safety glasses will be worn by the student. When using refrigerant or other pressurized substances, the student will wear safety glasses and gloves.

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Class Attendance Academic success is closely associated with regular classroom attendance and course participation. All successful students, whether on campus or online, are expected to be highly self-motivated. All students are required to participate in courses regularly and are obliged to participate in in-class activities and complete and submit assignments following their professors' instructions.

Responsibility for work missed because of illness or school business is placed upon the student and acceptance of late work is at the discretion of the instructor.

In accordance with the College's Developmental Education Plan, students withdrawing from their only developmental course may be withdrawn from all academic courses. In addition, students' eligibility to receive financial aid or live in a college dormitory can be affected by withdrawal from courses. When administrative withdrawal occurs, any tuition refund would be made in accordance with state regulations. Withdrawal from Class The administration of this institution has set deadlines for withdrawal from any college-level courses. These dates and times are published in that semester's schedule of classes. Administrative procedures must be followed. It is the student's responsibility to handle student-initiated withdrawal requirements from any class. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled (see GCC College Catalog for details).

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic Dishonesty, any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give an unfair advantage to a student or the attempt to commit such acts. Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the college's policy on plagiarism (see GCC Student Handbook for details). Grayson County College subscribes to turnitin.com, which allows faculty to search the web and identify the plagiarized material. The instructors of this department do not condone and highly discourage any of the above activities. If caught in the act, the following actions may be taken: -

- **First offense:** The removal of the assignment from the student(s) and a Zero for the assignment with no chance to make up.
- **Second offense:** The removal of the student(s) from the class with a failing grade for the course.
- **Copyright Notice** The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owner's rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act.

COVID-19 Syllabus Information

Grayson College continues to monitor the evolving COVID-19 situation and align our college planning

with guidance from the local and state health officials. Our primary goal is to protect the health and

safety of our students, faculty, staff, and the Grayson community, while delivering quality education. We

will continue to communicate as more information becomes available.

Safety requirements for students, faculty, staff, and the general public will be posted and kept current,

so please stay tuned to your Viking email and the COVID 19 page on the Grayson College website for

additional information or other changes that may be announced.

Grayson College COVID-19 Safety Protocol

The best way to prevent illness is to avoid being exposed to this virus. However, as a reminder, the Centers for Disease Control and Prevention (CDC) always recommends everyday preventive actions to help prevent the spread of respiratory diseases, including:

- Wash your hands often with soap and water for at least 20 seconds, especially after going to the bathroom; before eating; and after blowing your nose, coughing, or sneezing. If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol.
- Always wash hands with soap and water if your hands are visibly dirty.

Information about hand-washing, see CDC's Hand-washing website.

- Avoid touching your eyes, nose, and mouth.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
- Avoid close contact with people who are sick.
- Stay home when you are sick.

Grayson College COVID-19 Instructional Guidelines

Grayson College continues to monitor information relating to the COVID-19 Pandemic. The

College has taken steps to ensure that as many of our programs/courses can continue in the

event that the College must re-institute partial and/or full campus closure to the public.

Quality

education will be moved to a remote delivery format, when feasible, which includes one or more

of the following methods:

- Live Streaming instruction (synchronous)
- Recorded instruction (asynchronous)
- Online or web activities using the Canvas platform
- Video capture, both live and recorded sessions
- Use of open educational resources (OER) in place of traditional textbooks

Grayson College COVID-19 Lab Safety Protocol

In accordance with the Texas Department of Health and Human Services, Grayson College will

follow these guidelines:

Groups of 9 or less may be scheduled for small group labs, where hands-on skills are necessary

to be practiced or demonstrated

DMW 5.5.20

Social distancing will be practiced to reduce the risk of transferring germs

Faculty and students will be screened prior to entering a lab or classroom, which will

include:

- o Taking each person's temperature
- o Asking CDC-standard questions

All persons will wash hands with soap and water upon admittance

Students and faculty will participate in sanitation and cleaning of equipment and workspace at the

conclusion of each session

Students are encouraged to:

- Log in to Canvas and communicate with your faculty as needed.
- Study and complete assignments in a timely manner
- Ask questions along the way

Student Responsibility

You have already made the decision to go to college; now the follow-up decisions on whether to commit to doing the work could very well determine whether you end up working at a good paying job in a field you enjoy or working at minimum wage for the rest of your life. Education involves a partnership that requires both students and instructors to do their parts. By entering into this partnership, you have a responsibility to show up for class, do the assignments and reading, be engaged and pay attention in class, follow directions, and put your best effort into it. You will get out of your experience here exactly what you put into it – nothing more and nothing less

TITLE IX

GC policy prohibits discrimination on the basis of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex, sexual orientation, spousal affiliation and protected veterans status.

Furthermore, Title IX prohibits sex discrimination to include sexual misconduct: sexual violence (sexual assault, rape), sexual harassment and retaliation.

For more information on Title IX, please contact:

- Molly M. Harris, Title IX Coordinator (903)463-8714
- Logan Maxwell, Title IX Deputy Coordinator - South Campus (903) 415-2646
- Mike McBrayer, Title IX Deputy Coordinator - Main Campus (903) 463-8753
- Website: <http://www.grayson.edu/campus-life/campus-police/> (Links to an external site.)title (Links to an external site.)- (Links to an external site.)ix (Links to an external site.)-policies.html (Links to an external site.)
- GC Police Department: (903) 463-8777- Main Campus) (903-415-2501 - South Campus)
- GC Counseling Center: (903) 463-8730
- For Any On-campus Emergencies: 911

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Grayson College campus-wide student policies may be found on our Current Student Page on our website: <http://grayson.edu/current-students/index.html> (Links to an external site.)

Financial Aid Effective July 1, 2000, students receiving Title IV funds (Pell, Federal Grants, and Student Loans), who subsequently withdraw from classes, will be required to return a portion of the federal financial aid received. Only the percentage of aid earned (determined by the percentage of time attended) will be eligible for retention on the student's behalf. Any aid that is not earned must be returned to its source. If there is a student account balance resulting from these adjustments, the student is responsible for payment. Further details can be obtained from the Office of Financial Aid. Drop Rule Under section 51.907 of the Texas Education Code, "an institution of higher education may not permit a student to drop more than six courses, including any course a transfer student has dropped at another institution of higher education." This statute was enacted by the State of Texas in spring 2007 and applies to students who enroll in a public institution of higher education as first-time freshmen in fall 2007 or later. Any course that a student drops is counted toward the six-course limit if (1) the student drops a course after census date or (2) the student is not dropping the course in order to withdraw from the institution. Some exemptions for a good cause could allow a student to drop a course without having it counted toward this limit, but it is the responsibility of the student to establish that good cause before the drop. Students with questions should contact the Counseling Office or the Office of Admissions & Records for more information before dropping a course!

Grayson County College is not responsible for illness/injury that occurs during the normal course of classroom/lab/clinical experiences. These descriptions and timelines are subject to change at the discretion of the Professor.

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** Grayson College campus-wide student policies may be found at the following URL on the College website: <https://www.grayson.edu/currentstudents/Academic%20Resources/index.html>