



AGTC 124: POWER EQUIPMENT AIR & HEAT

Proposer:

Name:	Email:
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Effective Term:

Spring 2025

Credit Status:

Credit - Degree Applicable

Subject:

AGTC - Agricultural Technology

Course Number:

124

Discipline:

And/Or	(Discipline)
	(Agricultural Engineering (Equipment and machinery, farm mechanics))
Or		Agricultural Production (Animal science, plant science, beekeeping, aquaculture))

Catalog Title

Power Equipment Air Conditioning and Heating

Catalog Description

Students will learn the fundamentals of heating and air conditioning systems in agriculture power equipment. Environmental Protection Agency (EPA) regulations around these systems will be discussed. Students will learn how the different types of systems operate along with the different types of refrigerant oils. Students will learn the use of tools to troubleshoot diagnose and repair these systems as well.

Method of Instruction:

Laboratory
Lecture and/or Discussion

Course Units/Hours:
Course Units Minimum:

2

Lecture Hours Minimum (week)

2

Lab Hours Minimum (week)

1

Total Contact Hours Minimum (semester)

52.5

Total Outside Hours Minimum (semester)

70

Total Student Learning Minimum Hours (semester)

122.5

**Repeatability:**

No

Open Entry/Exit:

No

Field Trips:

Not Required

Grade Mode:

Standard Letter

TOP Code:

011600 - * Agricultural Power Equipment Technology

SAM Code:

C - Clearly Occupational

Course Content**Methods of Assessment:**

Problem solving assignments or activities

Project

Skill demonstrations

Course Topics:

Course Topics	
1	Fundamental knowledge including heat and heat energy, pressure and temperature relationship of refrigerant and the characteristics of different refrigerant oils.
2	Air conditioning system operation
3	EPA regulations on servicing air conditioning equipment
4	Testing, troubleshooting diagnosing and repairing air conditioning systems.
5	Heating system operation and service
6	Pressurized cabs

Course Objectives:

Course Objectives	
1	Be able to demonstrate knowledge of heat sources, types of heat transfer and how humidity affects heat transfer.
2	Demonstrate knowledge of the types of oils used in air conditioning systems.
3	Demonstrate knowledge on recovery, recycle and reclaiming of refrigerants.
4	Adhere to the EPA Clean Air Act refrigerant standards.
5	Properly connect and disconnect gauge manifold sets using proper procedures
6	Properly evacuate and dehydrate an air conditioning system.
7	Properly charge an air conditioning system.
8	Visually inspect an ac system
9	Describe heating system components and function.
10	Demonstrate knowledge of how to correctly remove, inspect and replace cab air filters.

Course Outcomes:

Course Outcomes	
1	Students will be able to identify air conditioning and heating system components and describe their function and operation.



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|---|---|
| 2 | Students will be able to use the correct tools to inspect, troubleshoot, and repair heating and air conditioning systems. |
| 3 | Students will be aware of EPA Clean Air Act standards for refrigerants. |

Assignments:

Assignment Type:	Details
Reading	Students will read a technical bulletin from the Environmental Protection Agency.
Writing	Students will write service reports describing operations they performed, findings of a diagnosis and repair procedure performed.
Homework	Students will read chapters from a textbook and answer questions.
Lab	Students will perform an air conditioning system evacuation

Textbooks or other support materials

Resource Type:	Details
Books	Auto Heating and Air Conditioning Fifth Edition; Chris Johanson, GW Publishers, Publication Date 2019, ISBN-10 1645641740

Equity Review:

Yes

Transferable to CSU

Yes - Proposed

Transferable to CSU Justification

This course is being proposed for CSU Transfer using transfer policy standards 2a and 2b

2a. In this course students will have to spend a lot of time learning the refrigeration cycle. This process uses the phase conversion law. Students will then have to use their understanding to understand how the air conditioning systems works in theory. Students will need to learn this at a brisk pace because once they have an understanding of the system they must then learn to troubleshoot and repair the air conditioning and heating systems in ag power equipment. This demonstrates high level critical thinking and problem solving at a level much higher than is required at the secondary level. Students will then have to articulate the problem they found with the system back to their instructor and demonstrate how they would communicate with a customer who may not have an understanding of how the system works thus having to teach the customer what they did and why they performed that repair.

2b. This course focuses on the theory and application of that theory in ag power equipment heating and air conditioning systems. If an entry level employee came into a dealership they would have to get training in heating and air conditioning systems in order to advance in their career. This course focuses on more than just skill acquisition but acquisition of theoretical knowledge and skills to then problem solve issues in the field.

CSU General Education

Transferable to CSU

This course will also be proposed for UC transfer.

No

Other Degree Attributes

Degree Applicable

Not a Basic Skills Course

Banner Title:

Power Equipment Air & Heat

Curriculum Committee Approval Date:

10/02/2024

Academic Senate Approval Date:

10/09/2024

District Governing Board Approval Date:

10/14/2024



Course Control Number:
CCC000646966