UAT 348: PRINCIPLES OF TRAINING ON CARBON DIOXIDE (R744) REFRIGERATION SYSTEMS (UA 6007)

Completed Workflow

1. UATD Chair (mdonham@wccnet.edu)
2. AT Dean (krue@wccnet.edu,esamulski@wccnet.edu)
3. C&A Assistant (aabooker@wccnet.edu)
4. Curricular Systems Coordinator (cacevans@wccnet.edu)
5. C&A Coordinator (sabird@wccnet.edu)
6. C&A Director (bjlinford@wccnet.edu)
7. Before Comm review (aabooker@wccnet.edu)
8. Comm Review step (sabird@wccnet.edu)
9. After Comm review (sabird@wccnet.edu,bjlinford@wccnet.edu)
10. Curriculum Committee Chair (rvanwagnen@wccnet.edu)
11. Assessment Committee Chair (jhale15@wccnet.edu)
12. Before VPI (sabird@wccnet.edu)
13. Vice President for Instruction (eloubert@wccnet.edu; brtucker@wccnet.edu)
14. Banner (cacevans@wccnet.edu)

Approval Path

1. 2026-05-03T17:38:45Z
   Marilyn Donham (mdonham): Approved for UATD Chair
2. 2026-05-03T18:02:37Z
   Kyrsten Rue (krue): Approved for AT Dean
3. 2026-05-05T14:06:17Z
   Sera Bird (sabird): Approved for C&A Assistant
4. 2026-05-05T15:53:20Z
   Carol Evans (cacevans): Approved for Curricular Systems Coordinator
5. 2026-05-22T16:53:43Z
   Sera Bird (sabird): Approved for C&A Coordinator
6. 2026-05-29T20:04:44Z
   Ben Linford (bjlinford): Approved for C&A Director
7. 2026-05-29T20:38:31Z
   Amber Booker (aabooker): Approved for Before Comm review
8. 2026-06-04T21:37:32Z
   Amber Booker (aabooker): Approved for Comm Review step
9. 2026-07-01T15:20:28Z
   Sera Bird (sabird): Approved for After Comm review
10. 2026-07-07T17:14:50Z
    Randy Van Wagnen (rvanwagnen): Approved for Curriculum Committee Chair
11. 2026-07-08T21:15:56Z
    Jessica Hale (jhale15): Approved for Assessment Committee Chair
12. 2026-07-09T13:22:10Z
    Sera Bird (sabird): Approved for Before VPI
13. 2026-07-09T13:24:33Z
    Brandon Tucker (brtucker): Approved for Vice President for Instruction
14. 2026-07-09T18:06:01Z
    Carol Evans (cacevans): Approved for Banner

History

1. Jul 9, 2026 by Anthony Esposito (tonyesposito)

New Course Proposal

Viewing: UAT 348 : Principles of Training on Carbon Dioxide (R744) Refrigeration Systems (UA 6007)

Changes proposed by: Anthony Esposito (tonyesposito)

Effective Term

Summer 2026

Rationale and proposal summary
New United Association course

Course Cover

Full Course Title
Principles of Training on Carbon Dioxide (R744) Refrigeration Systems (UA 6007)

Transcript Title
Principles Training CO2 (6007)

Subject Code
UAT - United Association Training

Course Number
348

Department
United Assoc Dept (UAT Only) (UATD)

Banner Division
ATP

Division/College
Adv Tech/Public Serv Careers (AT)

Org Code
28200

Course Description
In this course, students will analyze and apply the fundamentals of Carbon Dioxide (R744) refrigeration systems, with an emphasis on transcritical booster operation, thermodynamics, safety, system pressures, and control logic. Students will cover such topics as CO# (R744) refrigerant properties, system configurations, handling practices, schematics, component functions, and operating characteristics under varying conditions, using manufacturer-supported material. Upon completion, students will be able to explain key CO2 (R744) concepts, distinguish CO# systems from conventional hydrofluorocarbon (HFC)/ hydrochlorofluorocarbon (HCFC) applications, and apply system logic in both technical and instructional contexts. Limited to United Association Instructor Training Program graduates

Planned Delivery Format
Face to Face

Has this course been approved for virtual or blended virtual?
No

Has this course been approved for online or online blended?
No

Grading method
Standard Letter, Audit, Academic Forgiveness

CIP Code
469999 - Construction Trades, Other.

Occupational Indicator
Yes

ACS Code
130

Degree Attributes
BCL - Below College Level Pre-Reqs

Credit hours, contact hours, repeatability

Repeatable for additional credit
No

Course credits
1.5

Lecture contact hours
22.5

Lab contact hours
1.5

Total Contact Hours
24
Expected Total Contact Hours
24

Prerequisites and prerequisite skill levels

College-Level Math
No Level Required

College-Level Reading and Writing
College-level Reading and Writing

Approved Level I Prerequisite:
Academic Reading and Writing Levels of 6

Is concurrent enrollment an option for this prerequisite?
No

Course Assessment Plan
Learning Outcome

Outcome
Identify the physical, thermodynamic, and system design characteristics that distinguish CO# refrigeration systems from traditional HFC-based systems.

Assessment #1

Assessment Tool
Outcome-related exam questions

Anticipated Next Assessment Year
2029

Anticipated Next Assessment Term
Summer

Assessment Cycle
Every Three Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Answer key

Who does the scoring?
U.A. Instructors

Standard of success
80% of the students will score 80% or higher.

Assessment #2

Learning Outcome

Outcome
Identify CO# transcritical booster schematics that show refrigerant flow, component function, and control relationships.

Assessment #1

Assessment Tool
Outcome-related exam questions

Anticipated Next Assessment Year
2029

Anticipated Next Assessment Term
Summer

Assessment Cycle
Every Three Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Answer key

Who does the scoring?
U.A. Instructors

Standard of success
80% of the students will score 80% or higher.

Assessment #2

Learning Outcome

Outcome
Identify schematic symbols and points of the Copeland CO# (R744) on-site trainer, including major components, control points, and operation.

Assessment #1

Assessment Tool
Outcome-related exam questions

Anticipated Next Assessment Year
2029

Anticipated Next Assessment Term
Summer

Assessment Cycle
Every Three Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Answer key

Who does the scoring?
U.A. Instructors

Standard of success
80% of the students will score 80% or higher.

Assessment #2

Learning Outcome

Outcome
Apply CO# operating logic to changing conditions, symptoms, and instructional scenarios to explain system behavior.

Assessment #1

Assessment Tool
Outcome-related exam questions

Anticipated Next Assessment Year
2029

Anticipated Next Assessment Term
Summer

Assessment Cycle
Every Three Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Answer key

Who does the scoring?
U.A. Instructors

Standard of success
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Assessment #2

Course Objectives

	Objective(s)
1.	Identify the fundamental physical properties of CO# that influence system design, including critical point, triple point, and operating pressure characteristics.
2.	Differentiate CO# from common HFC/HCFC refrigerants in terms of environmental impact, pressure relationships, and operating behavior.
3.	Classify major R744 system designs, including secondary, cascade, and transcritical booster systems.
4.	Evaluate the safety, handling, pressure, and relief requirements associated with CO# refrigeration systems, including personal protective equipment (PPE).
5.	Trace refrigerant flow through a transcritical booster system schematic.

6.	Explain the operation of major system components, including the gas cooler, flash tank/receiver, compressors, high pressure valve (HPV), and bypass gas valve (BGV).
7.	Interpret the function of key control devices, transducers, and sensing points.
8.	Identify major trainer components and their functions.
9.	Examine the trainer layout to determine high-pressure regions and control critical sensing points.
10.	Select the trainer's instruction for the appropriate skill level for apprentice and journeyman learners.
11.	Analyze how changing operating conditions influence system behavior.
12.	Explain how flash tank pressure, gas cooler outlet conditions, and control actions affect system performance and stability.
13.	Identify pressure relationships, control functions, and operating modes to predict system behavior.

Resources

Will there be an additional fee on this course?
No

Are you planning to use First-Day resources?
No

Will this course always be OER/No Cost Resources?
No

Describe any resource needs
N/A

General Education Area(s)

Area 1: Writing
No

Area 2: 2nd Writing or Communication/Speech
No

Area 3: Mathematics
No

Area 4: Natural Science
No

Area 5: Social and Behavioral Science
No

Area 6: Arts and Humanities
No

MTA General Education
No

Review

Is conditional approval requested?
No

Is this course currently conditionally approved, and you are now submitting it for full approval?
No

Reviewer Comments
Sera Bird (sabird) (2026-05-05T14:06:15Z): Pulling forward to CSC queue.
Sera Bird (sabird) (2026-05-19T18:54:36Z): Sent suggestions to preparer 5/19/26

Sera Bird (sabird) (2026-05-22T16:53:38Z): Preparer agreed to suggestions for spelling out abbreviations, boilerplate language suggestions for tools, minor Outcome adjustments via email 5/21/26.

Sera Bird (sabird) (2026-06-10T18:24:57Z): Emailed feedback 6/9/26. Additional clarifications emailed 6/10/26.

Key: 9325