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HVAC Blueprint Information

Beginning in Fall 2016,

Year 1 will be taught and assessed using the 2016 HVAC.*

Year 2 will be taught and assessed using the 2009 HVAC.*

2009 HVAC curriculum will be retired July 1, 2017.*

*This assessment plan is subject to change based on funding and policy changes/updates. Information for test coordinators will be disseminated on the ordering process for the national certification by the Research and Curriculum Unit at Mississippi State University.



SEC – HVAC Blueprints

This document contains the blueprints for the concentration areas in secondary HVAC.

Course Code(s)	Test Code	Program Name	Supplemental Materials/Notes
993200, 993201, 993202	10236Y1-2016	Heating, Ventilation, and Air Conditioning	
993021, 993022, 990023	10236Y2-2009	Heating and Air Conditioning	

Curriculum	Perkins Assessment 2016-17		Teacher Evaluation Pilot 2016-17			
	Y1 Post-Test	Y2 Post-Test	Y1 Baseline	Y1 Post-Test	Y2 Baseline	Y2 Post-Test
HVAC	MS-CPAS2*	MS-CPAS2*	NA*	NA*	NA*	NA*

* These assessments are subject to change based on funding and policy changes/updates. Information for test coordinators will be disseminated on the ordering process for the national certification by the Research and Curriculum Unit at Mississippi State University.



MS-CPAS2 Blueprint Summary

Assessment: Heating, Ventilation, and Air Conditioning
Test Code: 10236Y1-2016
CIP Code: 470201
Course Codes: 993200, 993201, 993202
Type: CP

The MS-CPAS2 Blueprint Summary indicates the number of assessment questions related to each unit on the assessment and indicates the relative emphasis placed on each unit. All of the listed competencies will appear on the assessment, but because of the length of the assessment, not every competency will be equally represented in the assessment.

The MS-CPAS2 Blueprint Summary includes a variety of information, which is explained below:

Terms and Definitions	
Assessment:	This signifies the name of the assessment, which corresponds with the name of the pathway or program.
CIP Code:	Developed by the U.S. Department of Education's National Center for Education Statistics (NCES), CIP codes are a federal coding system utilized for assessment and reporting of fields of study and program completions activity tracking.
Test Code:	A unique code that serves to numerically identify a specific assessment
DOK Levels:	Based on Webb's Depth of Knowledge (DOK), this signifies the assessment item difficulty factor to be expected in each unit. The three levels are as follows: <i>1 = Recall and Reproduction, 2 = Skills and Concepts, 3 = Short-term Strategic Thinking</i> Some postsecondary programs will not use DOK levels until the next revision.
Instructional	The total number of hours assigned to a unit per the pathway's curriculum
Total Items:	The total number of items assigned to each unit on the assessment. It is calculated as follows: <i>(Unit Instructional Hours / Total Instructional Hours) * Total Active Items</i>
Active Items:	The number of items on the assessment that will be graded
Field-test Items:	The number of items that are being field-tested, or piloted, to determine their eligibility for inclusion as an Active Item on future assessments. These items are not graded and, thus, will not impact the student's final score.
Total Assessed Items:	The total number of items on the given assessment. It is calculated as follows: <i>Active Items + Field-test Items</i>

For more information regarding this MS-CPAS2 Blueprint Summary, please contact the Mississippi Assessment Center by phone at 1.866.901.7433 or by e-mail at helpdesk@rcu.msstate.edu.



Assessment: Heating, Ventilation, and Air	DOK Level(s)			Instructional Hours	Total Items
Test Code: 10236Y1-2016	1	2			
CIP Code: 470201					
Total Hours: 200					
Unit 1: Introduction and Orientation	1	2		20	8
1. Not tested on CPAS. 2. Describe employment opportunities and responsibilities. 3. Not tested on CPAS. 4. Demonstrate the ability to follow verbal and written instructions and communicate effectively in on-the-job situations.					
Unit 2: Basic Safety	1	2		35	14
1. Describe, define, and illustrate general safety rules for working in a shop/lab and how they relate to the manufacturing 2. Identify and apply safety around welding operations. 3. Display appropriate safety precautions to take around common jobsite hazards. 4. Demonstrate the appropriate use and care of personal protective equipment (PPE). 5. Explain fall protection, ladder, stair, and scaffold procedures and requirements. 6. Explain the material safety data sheet (MSDS). 7. Display appropriate safety procedures related to fires. 8. Explain safety in and around electrical situations.					
Unit 3: Construction Math	1	2		25	10
1. Apply the four basic math skills using whole numbers, fractions, decimals, and percentages, both with and without a calculator.					
Unit 4: Hand and Power Tools	1	2		30	12
1. Demonstrate the use and maintenance of hand and power tools.					
Unit 5: Introduction to Construction Drawings	1	2		20	8
1. Read, analyze, and understand basic components of a blueprint.					
Unit 6: Introduction to Materials Handling	1	2		20	8
1. Safely handle and store materials.					
Unit 7: Introduction to HVAC, Copper and Plastic Piping, and	1	2		50	20
1. Identify and explain heating, ventilation, air-conditioning, and refrigeration systems, HVAC/R environmental law, and job opportunities that are available in the HVAC/R profession. 2. Demonstrate the safe use and routine maintenance of hand and power tools used in the HVAC trade. 3. Identify and discuss the tools used in the piping trade, discuss the materials and methods of connecting piping systems, and perform copper and plastic piping tasks found in the industrial maintenance and HVAC environment. 4. Prepare and solder copper piping systems in various industrial and HVAC applications and properly clean, install fittings, and braze piping (silver solder).					
Unit 8: Basic Electricity	1	2		30	not tested
Unit 9: Basic Refrigeration Gauges	1	2		40	not tested



	Active Items	80
	Field-Test Items	20
	TOTAL ASSESSED ITEMS	100



MS-CPAS2 Blueprint Summary

Assessment: HVAC
Test Code: 10236Y2-2009
CIP Code: 470201
Course Codes: 993021,993022, 990023
Type: CP

The MS-CPAS2 Blueprint Summary indicates the number of assessment questions related to each unit on the assessment and indicates the relative emphasis placed on each unit. All of the listed competencies will appear on the assessment, but because of the length of the assessment, not every competency will be equally represented in the assessment.

The MS-CPAS2 Blueprint Summary includes a variety of information, which is explained below:

Terms and Definitions	
Assessment:	This signifies the name of the assessment, which corresponds with the name of the pathway or program.
CIP Code:	Developed by the U.S. Department of Education's National Center for Education Statistics (NCES), CIP codes are a federal coding system utilized for assessment and reporting of fields of study and program completions activity tracking.
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DOK Levels:	Based on Webb's Depth of Knowledge (DOK), this signifies the assessment item difficulty factor to be expected in each unit. The three levels are as follows: <i>1 = Recall and Reproduction, 2 = Skills and Concepts, 3 = Short-term Strategic Thinking</i> Some postsecondary programs will not use DOK levels until the next revision.
Instructional Hours:	The total number of hours assigned to a unit per the pathway's curriculum
Total Items:	The total number of items assigned to each unit on the assessment. It is calculated as follows: <i>(Unit Instructional Hours / Total Instructional Hours) * Total Active Items</i>
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Total Assessed Items:	The total number of items on the given assessment. It is calculated as follows: <i>Active Items + Field-test Items</i>

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Assessment: HVAC Test Code: 10236Y2-2009 CIP Code: 470201 Total Hours: 275	DOK Level(s)			Instructional Hours	Total Items
	1	2			
Unit 6: Trade Math, Ferrous Metal Piping Practice, Introduction to Cooling, and Introduction to Heating	1	2		140	41
1. Identify proper math to use for problem solving; use English and metric measurement; use powers, algebra, and geometric calculation to solve for HVAC problems; and convert Fahrenheit to Celsius. 2. Recognize types and sizes of ferrous metal piping and pipe fittings, and also recognize and use tools used to cut, ream, and thread ferrous pipe in the HVAC application. 3. Explain the basic theory of cooling systems, heat transfer, trade terms, refrigerants, components of the cooling system, controls, and proper piping of the cooling system. 4. Explain methods of heat transfer and characteristics of combustion, identify types of fuels and types of furnaces and components of the electric and gas furnace, identify and safely use meters in gas measurement, and perform maintenance on electric and gas furnaces.					
Unit 7: Air Distribution Systems, Leak Detection Evacuation	1	2		135	39
1. The student will understand the general practices of designing and installing HVAC duct and piping systems. 2. The student will identify leaks in an HVAC system and perform the proper steps to repair the leak restoring the unit to operation. 3. Gain an understanding of the safe operation of electrical transformers, motors, and single- and three-phase HVAC devices. 4. Explain and apply basic electrical theory to HVAC applications and how to troubleshoot common electronic devices found in HVAC systems.					
Active Items					80
Field-Test Items					20
TOTAL ASSESSED ITEMS					100