

## Washtenaw Community College Comprehensive Report

### UAT 263A Delivering a Building Automation Program in HVACR (UA 6008) Effective Term: Spring/Summer 2025

#### Course Cover

**College:** Advanced Technologies and Public Service Careers

**Division:** Advanced Technologies and Public Service Careers

**Department:** United Association Department (UAT Only)

**Discipline:** United Association Training

**Course Number:** 263A

**Org Number:** 28200

**Full Course Title:** Delivering a Building Automation Program in HVACR (UA 6008)

**Transcript Title:** Deliver Bldg Automation 6008

**Is Consultation with other department(s) required:** No

**Publish in the Following:**

**Reason for Submission:** New Course

**Change Information:**

**Rationale:** New United Association course

**Proposed Start Semester:** Spring/Summer 2024

**Course Description:** In this course, students will identify the equipment and processes needed to create a Building Automation and Energy Management Program. An overview of building automation systems (BAS) applications, direct digital control (DDC) systems, and energy management calculations (used to control HVACR equipment) will be covered. Students will learn about energy conservation, control strategies and human interfaces, as well as the maintenance of systems. Hands-on BAS practical trainers will be presented and demonstrated in lab sessions. Limited to United Association program participants.

#### Course Credit Hours

**Variable hours:** No

**Credits:** 1.5

**The following Lecture Hour fields are not divisible by 15: Student Min ,Instructor Min**

**Lecture Hours: Instructor: 22.5 Student: 22.5**

**The following Lab fields are not divisible by 15: Student Min, Instructor Min**

**Lab: Instructor: 1.5 Student: 1.5**

**Clinical: Instructor: 0 Student: 0**

**Total Contact Hours: Instructor: 24 Student: 24**

**Repeatable for Credit:** NO

**Grading Methods:** Letter Grades

Audit

**Are lectures, labs, or clinicals offered as separate sections?:** NO (same sections)

#### College-Level Reading and Writing

College-level Reading & Writing

#### College-Level Math

#### Requisites

#### General Education

## **Request Course Transfer**

### **Proposed For:**

## **Student Learning Outcomes**

1. Identify components of direct digital control (DDC) systems used in building automation.

### **Assessment 1**

Assessment Tool: Outcome-related quiz

Assessment Date: Spring/Summer 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 80% of the students will score 80% or higher.

Who will score and analyze the data: U.A. Instructors

2. Demonstrate maintenance and troubleshooting techniques for DDC systems.

### **Assessment 1**

Assessment Tool: Outcome-related skills demonstration

Assessment Date: Spring/Summer 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Checklist

Standard of success to be used for this assessment: 80% of the students will score 80% or higher.

Who will score and analyze the data: U.A. Instructors

3. Demonstrate the set-up and programming of DDC systems for predetermined building designs.

### **Assessment 1**

Assessment Tool: Outcome-related skills demonstration

Assessment Date: Spring/Summer 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Checklist

Standard of success to be used for this assessment: 80% of the students will score 80% or higher.

Who will score and analyze the data: U.A. Instructors

## **Course Objectives**

1. Review the basics of DDC systems.
2. Compare and contrast the different types of DDC systems.
3. Explain inputs and outputs for DDC systems.
4. Discuss pneumatics control systems and ways to retrofit DDC systems to existing controls.
5. Demonstrate basic troubleshooting techniques for DDC Systems.
6. Explain the maintenance and replacement of DDC components.
7. Explain the combining of pneumatic control systems and DDC systems and as well as the benefits.
8. Discuss energy management as it relates to control design including payback programs utilizing energy management calculations.
9. Discuss and perform basic and advanced programming tasks.
10. Explain how proportional integral and derivative (PID) loops work.
11. Design and present a DDC program demonstrating the equipment and sequence of operation.

## New Resources for Course

### Course Textbooks/Resources

Textbooks

American Technical Publishers . *ATP (2014)*, ed. ATP, 2014, ISBN: 978-0-8269-20.

Manuals

Periodicals

Software

### Equipment/Facilities

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
<b>Faculty Preparer:</b> <i>Tony Esposito</i>	<i>Faculty Preparer</i>	<i>May 03, 2024</i>
<b>Department Chair/Area Director:</b> <i>Marilyn Donham</i>	<i>Recommend Approval</i>	<i>May 07, 2024</i>
<b>Dean:</b> <i>Eva Samulski</i>	<i>Recommend Approval</i>	<i>May 15, 2024</i>
<b>Curriculum Committee Chair:</b> <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Jan 11, 2025</i>
<b>Assessment Committee Chair:</b> <i>Jessica Hale</i>	<i>Recommend Approval</i>	<i>Nov 22, 2024</i>
<b>Vice President for Instruction:</b> <i>Brandon Tucker</i>	<i>Approve</i>	<i>Jan 13, 2025</i>