

UAT 244: FUNDAMENTALS OF VARIABLE FREQUENCY DRIVES

History

1. Dec 5, 2025 by Sera Bird (sabird)

Viewing: UAT 244 : Fundamentals of Variable Frequency Drives

Last approved: 2025-12-05T08:04:06Z

Last edit: 2025-12-01T21:00:55Z

Effective Term

Winter 2026

Rationale and proposal summary

#Update to UA course to reflect current technologies and trends in the industry.

Course Cover

Full Course Title

Fundamentals of Variable Frequency Drives

Transcript Title

Fund Variable Frequency Drives

Subject Code

UAT - United Association Training

Course Number

244

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 identify the theory and operation of variable frequency drive (VFD) motors and controllers that can be used for instruction at local Training Centers. Through classroom and hands-on lab activities, students will review installation and troubleshooting, including complete factory startup on various manufacturers' equipment. Students will also navigate online UA resources to develop their VFD class at their local Training Center. Limited to United Association program participants.

Has this course been approved for online or online blended?

No

Grading method

Standard Letter, Audit

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

Course Assessment Plan

Learning Outcome

Outcome

Recognize VFD theory and component layout.

Assessment #1

Assessment Tool

Outcome-related test questions

Anticipated Next Assessment Year

2025

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**

Perform basic VFD programming, power and control wiring.

Assessment #1**Assessment Tool**

Outcome-related demonstration

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Summer

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Observational checklist

Who does the scoring?

U.A. instructors

Standard of success

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

Assessment #2

Learning Outcome**Outcome**

Prepare and present a VFD lesson plan and activity.

Assessment #1**Assessment Tool**

Presentation

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Summer

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Rubric

Who does the scoring?

U.A. instructors

Standard of success

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

Assessment #2**Course Objectives**

	Objective(s)
1.	Identify and define the theory and concepts of VFD motors.
2.	Identify field applications and limitations of VFD motors and controllers.
3.	Explain electrical safety precautions and personal protective equipment (PPE) when servicing VFDs.
4.	Describe the principles of drive theory.
5.	Compare and contrast the features and applications of control wiring and power wiring.
6.	Identify procedures to perform factory startup.
7.	Perform and document factory startup of predetermined manufacturers' components.
8.	Discuss course customization for use at local Training Centers.
9.	Access, navigate and download online UA resources and materials available for use at local Training Centers.
10.	Prepare and present a five-minute lesson plan and activity for peer review.

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

Key: 8905

Washtenaw Community College Comprehensive Report

UAT 244 Fundamentals of Variable Frequency Drives Effective Term: Fall 2020

Course Cover

Division: Advanced Technologies and Public Service Careers

Department: United Association Department

Discipline: United Association Training

Course Number: 244

Org Number: 28200

Full Course Title: Fundamentals of Variable Frequency Drives

Transcript Title: Fund Variable Frequency Drives

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Web Page

Reason for Submission: Course Change

Change Information:

Consultation with all departments affected by this course is required.

Course description

Total Contact Hours

Outcomes/Assessment

Objectives/Evaluation

Rationale: Update United Association course

Proposed Start Semester: Fall 2020

Course Description: In this course, students will identify the theory and operation of variable frequency drive (VFD) motors and controllers that can be used for instruction at local Training Centers. Students will review installation and troubleshooting, including complete factory startup on various manufacturers' equipment through classroom and hands-on lab activities. Students will also navigate online UA resources in order to develop their own VFD class at their local Training Center. 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

Degree Attributes

Below College Level Pre-Reqs

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Recognize VFD theory and component layout.

Assessment 1

Assessment Tool: Outcome-related test questions

Assessment Date: Fall 2020

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 basic VFD programming, power and control wiring.

Assessment 1

Assessment Tool: Demonstration

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Observational 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. Prepare and present a VFD lesson plan and activity.

Assessment 1

Assessment Tool: Presentation

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Observational 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. Identify and define the theory and concepts of VFD motors.
2. Identify field applications and limitations of VFD motors and controllers.
3. Explain electrical safety precautions and personal protective equipment (PPE) when servicing VFDs.
4. Describe the principles of drive theory.
5. Compare and contrast the features and applications of control wiring and power wiring.

6. Identify procedures to perform factory startup.
7. Perform and document factory startup of predetermined manufacturers' components.
8. Discuss course customization for use at local Training Centers.
9. Access, navigate and download online UA resources and materials available for use at local Training Centers.
10. Prepare and present a five-minute lesson plan and activity for peer review.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Tony Esposito</i>	<i>Faculty Preparer</i>	<i>Aug 25, 2020</i>
Department Chair/Area Director: <i>Marilyn Donham</i>	<i>Recommend Approval</i>	<i>Sep 23, 2020</i>
Dean: <i>Jimmie Baber</i>	<i>Recommend Approval</i>	<i>Oct 01, 2020</i>
Curriculum Committee Chair: <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Oct 30, 2020</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Nov 04, 2020</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Nov 09, 2020</i>