DEPARTMENT OF
HIGHER EDUCATION &
WORKFORCE DEVELOPMENT

# New Program Report

**Date Submitted:**
10/25/2021

## Institution
Ozarks Technical Community College

## Site Information

**Implementation Date:**
8/22/2022 12:00:00 AM

Added Site(s):

Selected Site(s):

Ozarks Technical Community College, 1001 E. Chestnut Expressway, Springfield, MO, 65802

## CIP Information

**CIP Code:**
150406

**CIP Description:**
A program that prepares individuals to apply basic engineering principles and technical skills in support of engineers and other professionals engaged in developing, installing, calibrating, modifying and maintaining automated systems. Includes instruction in computer systems; electronics and instrumentation; programmable logic controllers (PLCs); electric, hydraulic and pneumatic control systems; actuator and sensor systems; process control; robotics; applications to specific industrial tasks; and report preparation.

**CIP Program Title:**
Automation Engineer Technology/Technician

**Institution Program Title:**
Automation and Robotics

## Degree Level/Type

**Degree Level:**
Associate Degree

**Degree Type:**
Associate in Applied Science

**Options Added:**

Collaborative Program:
N

## Mode of Delivery

Current Mode of Delivery

Classroom

## Student Preparation

Special Admissions Procedure or Student Qualifications required:
No special preparation required.

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Specific Population Characteristics to be served:
n/a

## Faculty Characteristics

Special Requirements for Assignment of Teaching for this Degree/Certificate:
All full time faculty will need a minimum of an Associate's Degree in a related field or 5 or more years of industry experience in automation/robotics, and valid Missouri teaching certificate with the Department of Elementary & Secondary Education.

Estimate Percentage of Credit Hours that will be assigned to full time faculty:
Full time faculty will be assigned to an estimated 85 percent of the credit hours for this degree.

Expectations for professional activities, special student contact, teaching/learning innovation:
Faculty members are required to document at least 20 hours of professional development on an annual basis. Faculty will assist in student advisement who have designated this as their degree option.

## Student Enrollment Projections Year One-Five

| | | | |
|---|---|---|---|
| **Year 1** | **Full Time:** 8 | **Part Time:** 16 | |
| **Year 2** | **Full Time:** 16 | **Part Time:** 20 | |
| **Year 3** | **Full Time:** 20 | **Part Time:** 25 | **Number of Graduates:** 20 |
| **Year 4** | **Full Time:** 23 | **Part Time:** 26 | |
| **Year 5** | **Full Time:** 28 | **Part Time:** 30 | **Number of Graduates:** 55 |

**Percentage Statement:**
90.00

## Program Accreditation

Institutional Plans for Accreditation:
There are no plans at this time to seek specialized accreditation. However, the program will partner with Fanuc America and ABB Robotics for industry recognized credentialing.

## Program Structure

**Total Credits:**
63

**Residency Requirements:**
15 of the last 30

**General Education Total Credits:**
16

**Major Requirements Total Credits:**
47

**Course(s) Added**

| COURSE NUMBER | CREDITS | COURSE TITLE |
|---|---|---|
| MEC 170 | 4 | Industrial Motors and Controls |

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| | | |
|---|---|---|
| MEC 225 | 4 | Programmable Logic Control I |
| TEC 285 | 1 | Occupational Seminar |
| ARO 247 | 4 | Advanced Automation Controls |
| MEC 246 | 4 | Programmable Logic Control II |
| MEC 200 | 4 | Mechanical Power Transmission |
| ARO 280 | 3 | Robotic Vision |
| MEC 290 | 1 | Co-Operative Education/Internship |
| NET 111 | 3 | IT Essentials for MFG |
| MEC 125 | 4 | Fluid Power |
| ARO 273 | 4 | Industrial Robotics |
| MEC 130 | 4 | Industrial Electricity |
| MEC 260 | 4 | Industrial Systems Maintenance |
| MEC 120 | 3 | Industrial Safety |

**Free Elective Credits:**
0

**Internship or other Capstone Experience:**
Internship requirements is recommended 2.0 GPA and 30 credit hours in ARO specific coursework; Capstone course requirements are MEC-120 MEC-125 MEC-130 MEC-225 and MEC-200 as prerequisites, and MEC 170 must be taken either prior to or at the same time as this course.

## Assurances

I certify that the program is clearly within the institution's CBHE-approved mission. The proposed new program must be consistent with the institutional mission, as well as the principal planning priorities of the public institution, as set forth in the public institution's approved plan or plan update.

I certify that the program will be offered within the proposing institution's main campus or CBHE-approved off-site location.

I certify that the program will not unnecessarily duplicate an existing program of another Missouri institution in accordance with 6 CSR 10-4.010, subsection (9)(C) Submission of Academic Information, Data and New Programs.

I certify that the program will build upon existing programs and faculty expertise.

I certify that the program can be launched with minimal expense and falls within the institution's current operating budget.

I certify that the institution has conducted research on the feasibility of the proposal and it is likely the program will be successful. Institutions' decision to implement a program shall be based upon demand and/or need for the program in terms of meeting present and future needs of the locale, state, and nation based upon societal needs, and/or student needs.

## Contact Information

First and Last Name: RENEE
GRAVES

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Email: gravesr@otc.edu
Phone: 417-447-8115

**Student ID:**_____
**Student Name:**_____
**Navigator Name:**_____

**Catalog: 2022-2023 Academic Catalog and Student Handbook**
**Program: Automation and Robotics (A.A.S.)**

# Automation and Robotics (A.A.S.)

**A.A.S. Degree: 63 Hours**

The Automation and Robotics program provides students with the introductory skills to be successful in a high-tech Industry 4.0 career in automated manufacturing. In this program, you will learn to develop, install, and maintain automated systems commonly used in modern manufacturing. Topics of study include electrical, mechanical, and fluid power systems, programmable logic controllers (PLCs), industrial robotics and industrial networking communications. Graduates of this program have opportunities to earn industry recognized credentials and are prepared to enter the industry as automation and maintenance technicians.

**Note:** Students will not be eligible to graduate with both an Associate of Applied Science in Automation and Robotics (AAS.ARO) and an Associate of Applied Science in Mechatronics (AAS.MEC).

## Automation and Robotics Program Requirements - 47 Credit Hours

| Course Name | Credits: | Semester Completed | Grade | CORE 42 |
|---|---|---|---|---|
| ARO-247 Advanced Automation Controls<br>*Prerequisite(s):* Grade "C" or better in MEC 246; NET 111 or concurrent enrollment. | Credits: 4 | | | |
| ARO-273 Industrial Robotics | Credits: 4 | | | |
| ARO-280 Robotic Vision<br>*Prerequisite(s):* Grade of "C" or better in MEC 273. | Credits: 3 | | | |
| MEC-120 Industrial Safety | Credits: 3 | | | |
| MEC-125 Fluid Power | Credits: 4 | | | |
| MEC-130 Industrial Electricity I | Credits: 4 | | | |
| MEC-170 Industrial Motors and Controls<br>*Prerequisite(s):* MEC 130 or MEC 255. | Credits: 4 | | | |
| MEC-200 Mechanical Power Transmission | Credits: 4 | | | |
| MEC-225 Programmable Logic Control I | Credits: 4 | | | |
| MEC-246 Programmable Logic Control II<br>*Prerequisite(s):* MEC 225 or MEC 255. | Credits: 4 | | | |
| MEC-260 Mechatronics Capstone<br>*Prerequisite(s):* MEC 120, MEC 125, MEC 130, MEC 200, MEC 225; MEC 140, MEC 170 or concurrent enrollment. | Credits: 4 | | | |
| MEC-290 Co-operative Education/Internship<br>*Prerequisite(s):* Instructor consent. | Credits: Variable 1-3 | | | |
| NET-111 IT Essentials for MFG | Credits: 3 | | | |
| TEC-285 Occupational Seminar | Credits: 1 | | | |

## General Education Requirements - 16 Credit Hours

CORE 42 is a statewide general education course of study intended to ensure that all graduates possess a common core of college-level skills and knowledge. CORE 42 specifies the basic competencies and knowledge areas that all students completing degrees at a Missouri public institution of higher education must complete. CORE 42 is comprised of dozens of courses distributed across five knowledge areas. These courses are designated with a Missouri Transfer (MOTR) course number, which guarantees the one-to-one transfer of these courses among all Missouri public institutions of higher education. Please refer to MDHE Core Transfer Curriculum for detailed information on CORE 42 courses.

All knowledge areas below, designated with the CORE 42 logo, indicate all courses in that area have been evaluated and provided a MOTR number for transfer to all Missouri public institutions of higher education.

## Mathematical Sciences - 3 Credit Hours

| Course Name | Credits: | Semester Completed | Grade | CORE 42 |
|---|---|---|---|---|
| TEC-108 Applied Technical Mathematics | Credits: 3 | | | |
| MTH-110 Intermediate Algebra | Credits: 4 | | | |
| MTH-128 Contemporary Mathematics | Credits: 3 | | | |
| MTH-128S Cont Mathematics with Support | Credits: 4 | | | |
| MTH-130 College Algebra | Credits: 3 | | | |
| MTH-130S College Algebra With Support | Credits: 4 | | | |

| | | | | |
|---|---|---|---|---|
| MTH-131 Trigonometry<br>*Prerequisite(s):* Grade of "C" or better in MTH 130 or satisfactory score on the ACT. | Credits: 3 | | | |
| MTH-138 Pre-Calculus Mathematics<br>*Prerequisite(s):* Grade of "B" or better in MTH 110 or satisfactory score on the ACT. | Credits: 5 | | | |
| MTH-140 Analytic Geometry and Calculus I<br>*Prerequisite(s):* Grade of "C" or better in MTH 131 or MTH 138 or satisfactory score on the ACT. | Credits: 5 | | | |
| MTH-141 Analytic Geometry and Calculus II<br>*Prerequisite(s):* Grade of "C" or better in MTH 140. | Credits: 5 | | | |
| MTH-210 Statistical Methods<br>*Prerequisite(s):* Grade of "C" or better in MTH 128 or MTH 130 or satisfactory score on the ACT. | Credits: 3 | | | |
| MTH-214 Discrete Mathematics<br>*Prerequisite(s):* Grade of "C" or better in MTH 131 or MTH 138 or satisfactory score on the ACT. | Credits: 3 | | | |
| MTH-215 Algebraic Structures<br>*Prerequisite(s):* Grade of "C" or better in MTH 140. | Credits: 3 | | | |
| MTH-230 Linear Algebra<br>*Prerequisite(s):* Grade of "C" or better in MTH 141. | Credits: 3 | | | |
| MTH-240 Analytic Geometry and Calculus III<br>*Prerequisite(s):* Grade of "C" or better in MTH 141. | Credits: 3 | | | |
| MTH-241 Differential Equations<br>*Prerequisite(s):* Grade of "C" or better in MTH 240. | Credits: 3 | | | |

## Written Communications - 3 Credit Hours

| Course Name | Credits: | Semester Completed | Grade | CORE 42 |
|---|---|---|---|---|
| ENG-100 Composition I With Support **or** | Credits: 5 | | | |
| ENG-101 Composition I | Credits: 3 | | | |

## Oral/Written Communications - 3 Credit Hours

| Course Name | Credits: | Semester Completed | Grade | CORE 42 |
|---|---|---|---|---|
| COM-100 Introduction to Communication | Credits: 3 | | | |
| COM-105 Public Speaking | Credits: 3 | | | |
| ENG-150 Technical Writing<br>*Prerequisite(s):* ENG 100 or ENG 101. | Credits: 3 | | | |

## Natural Sciences - 4 Credit Hours

| Course Name | Credits: | Semester Completed | Grade | CORE 42 |
|---|---|---|---|---|
| TES-140 Technical Physics<br>*Prerequisite(s):* Grade of "C" or better in TEC 108 or higher | Credits: 4 | | | |
| BIO-100 Life Science | Credits: 4 | | | |
| BIO-160 General Biology I | Credits: 5 | | | |
| CHM-101 Introductory Chemistry | Credits: 4 | | | |
| CHM-160 General Chemistry I<br>*Prerequisite(s):* Grade of "C" or better in MTH 110 or higher, or satisfactory score on the ACT. | Credits: 4 | | | |
| PHY-105 Introduction to Physics<br>*Prerequisite(s):* Knowledge of algebra, scatter plot graphing, slope and equation of the line, scientific notation, and unit conversions is recommended. | Credits: 4 | | | |
| PHY-120 General Physics I<br>*Prerequisite(s):* Grade of "C" or better in MTH 130 or equivalent (MTH 131 recommended). | Credits: 4 | | | |
| PHY-220 Physics Engrs & Scientists I<br>*Prerequisite(s):* Grade of "C" or better in MTH 140. | Credits: 5 | | | |

## Social and Behavioral Sciences - 3 Credit Hours

| Course Name | Credits: | Semester | Grade | CORE 42 |
|---|---|---|---|---|

| | | Completed | | |
|---|---|---|---|---|
| HST-120 U.S. History I: to 1865 | Credits: 3 | | | |
| HST-130 U.S. History II: 1865-Present | Credits: 3 | | | |
| PLS-101 American Government and Politics | Credits: 3 | | | |
| **Notes:** | | | | |