NORCO COLLEGE | Career Education

MAN/SCA Advisory Committee Meeting Minutes
Date: Friday, March 17, 2023
Time: 9 – 10:15 AM
Room: IT-124

Industry Partner Attendees:

Robert Morrison, Eibach
Jeremy Chappelle, Eibach
Judy Lopez, Microdyne
Tracey Kimberlin, Microdyne
Estefania Godoy, Luxfer Gas Cylinders
Joana Lozano, Luxfer Gas Cylinders
Alexis Soltero, Luxfer Gas Cylinders
Larry Boyer, Luxfer Gas Cylinders
Victor DeFiesta, Collins Aerospace
Nelson Htoy, Collins Aerospace
Jason Whitman, Collins Aerospace
Mike Trejo, Society of Wood Manufacturing
Diana Ramirez, Reborn Cabinets/SWM
Joshua Weekes, US Airforce
Steve Harrington, NCSCA
George Beloz, President's Advisory Board
Josh Balog, Target
Josh Gonzalez, Target
Stephanie Davidson, Eibach
Alan Braggins, IEDRC
Richard Radcliffe, Victor Valley College
Natalie Weaver, LAUNCH Apprenticeship
Marisa Miley-Blanchard, LAUNCH Apprenticeship
Jason Edwards, Amazon

College Attendees:

Jesus Vela, NC Faculty
Paul Van Hulle, NC Faculty
Valorie Piper, Program Director
Ashley Etchison, Associate Dean
Paula Barrera Partida, Employment Placement Coordinator

Recorder: Paula Barrera Partida

1. Welcome and Introductions, start time 9:15 AM
2. Call for additional agenda items to be added to this meeting's agenda
    a. Industry Partner requested automation, to be able to develop a team who runs the machines rather than packing them
    b. For employers: willingness to take internships & apprenticeships
3. Annual Recap
    a. In the Manufacturing (MAN) courses, Faculty Hulle is integrating robotics, PLC, and creating project boards. Ask industry partners if it is about the wiring or the programming or if students need a blend of both for PLCs. Industry partners responded with all of the above.

b. In the Electrical (ELE)/Supply Chain Automation (SCA) courses, students are learning troubleshooting skills with simulators and project boards. Students are given the print to start thinking of the approach and troubleshooting to find the issue.

4. Instruction and Curriculum changes
   a. Faculty Vela shared about the upcoming certificates under Supply Chain Automation. These certificates are stackable, meaning that a student will build on their skills as they complete levels one, two, and three. ***[Handout 1 – Program Outline of Record Credit Degrees and Certificates]***
      i. Industrial/Supply Chain Automation Technician I
      ii. Industrial/Supply Chain Automation Technician II
      iii. Industrial/Supply Chain Automation Technician III
   b. These programs will also be available for students under our Manufacturing Apprenticeship program and partnered employers.
   c. ***[Handout 2 – Course Outline of Record]*** Faculty Vela and Van Hulle shared three new courses SCA-1, SCA-10, and SCA-12 starting with the basics of tooling in Supply Chain and Manufacturing.
   d. ***Industry Partners*** – recommended to retitle the program:
      i. Automation Technician
      ii. Maintenance Technician is also the most common job title for our industry partners. These individuals are the jack of all trades at their facility.
      iii. When selling the programs to younger students, there needs to be a title that is appealing, attractive, and appealing to get them interested.
   e. These programs can take on average about 18 months but do depend on the individual students and employment if employed. Most courses are offered during the evening and some on weekends.
   f. Best practices shared by industry partners:
      i. One employer allows them to be flexible and come to Norco to take courses
      ii. Another, has one of the machines at their facility so that students continue to learn
      iii. Norco College is willing to also be flexible to fit the industry by offering courses around the biggest need of time and days. There is also a hybrid modality, especially in our manufacturing courses (MAN), where the lecture is online and the lab is in person in the evenings to be flexible with the students.
5. Outreach and Recruitment
   a. Students
   b. Advisory Council members
6. Other
   a. Faculty Van Hulle and Vela asked our industry partners to write additional feedback and comments, see attached document.
7. Review actions and next steps
8. Set a date, time, and place for the next meeting.
9. Adjournment

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MORENO VALLEY COLLEGE | NORCO COLLEGE | RIVERSIDE CITY COLLEGE

Program Outline of Record – Credit Degrees and Certificates

Program Outline

Title: Industrial/Supply Chain Automation Technician I

Originator: Paul Van Hulle and Jesus Vela **Date** 2/23/2023

Department: BEIT/Manufacturing

College/Learning Pathway/Engagement Center: Norco - School of Science, Technology, Engineering & Mathematics

☐ **Moreno Valley College** ☒ **Norco College** ☐ **Riverside City College**
(Please note: All degrees and certificates are college specific. If multiple colleges wish to adopt this degree or certificate, a separate proposal and college specific supporting documents are required.)

TOPs Code: 0956.00 **CIP Code: ??**

Type of Program:
☒ Certificate of Achievement only ☐ Locally approved certificate (8-units or less) only
☐ Associate Degree only ☐ Certificate of Achievement and Degree

Type of Associate Degree: ☐ Associate of Arts ☐ Associate of Science

This is a: ☐ New certificate/degree* ☒ Modification to an existing certificate/degree

This is a modification to the Industrial Automation Certificate numbered NAS737/NAS737B/NAS737C/NCE737

***New programs that require new facilities, positions, capital outlays, or have budgetary impacts must also be approved by Academic Senate and Strategic Planning before being submitted. Has this program been appropriately approved?**

☐ Yes, minutes attached ☐ Approval Pending
☒ No Capital or Budgetary Impacts

If this is a modification to an existing certificate/degree, please specify the changes being made:
(Please be specific! Indicate any changes to title, description, learning outcomes, courses, unit values, etc.)

Rationale:
(Please note: This information will be presented to the Board of Trustees.)

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Program Outline of Record – Credit Degrees and Certificates

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All Degrees and Certificates

☐ Evidence of district-wide discipline communication
☐ Department minutes showing approval
☐ Narrative *(see following page)*
☐ Transfer preparation documentation *(only if applicable)*

Degrees and Certificates of 8 Units or More with Vocational TOPs Codes

In addition to the above, all degrees and certificates of 8 units or more with a vocational TOPs code must include the following to be submitted to the State Chancellor's Office for approval.*

☒ Labor Market Information and Analysis *(Required for new programs and modifications.)*
☐ Advisory Committee Recommendation *(Required for new programs and may be required for modifications. Check with the curriculum coordinator at your college to determine if a new recommendation is necessary.)*
☐ Regional Consortium Recommendation *(Required for new programs only.)*

**Certificates between 8 and less than 16 units can be approved locally or can be submitted to the State Chancellor's Office for approval. Certificates of less than 8 units can only be approved locally. However, locally approved certificates will not appear on student transcripts.*

Program Narrative

Item 1. Program Goals and Objectives

For programs with a vocational TOPs code, must address a valid workforce preparation purpose. For programs with a non-vocational TOPs code, must address a valid workforce preparation, basic skills, civic education, or local purpose. May address transfer preparation if applicable.

Upon successful completion of this program, students should be able to:
- Demonstrate knowledge of tools and testing methods for maintenance techniques.
- Apply maintenance fundamentals to simulated and actual workplace applications.
- Recognize, identify, and describe the functions of hand and power tools.
- Troubleshoot and repair a given, complex configuration of maintenance equipment

Item 2. Catalog Description

Includes program requirements, prerequisite skills or enrollment limitations, program learning outcomes, and information relevant to program goal.

The Associate in Science in the Industrial Automation program prepares students for jobs such as entry-level facility maintenance technician, field service technician, industrial maintenance technician, maintenance mechanic, or maintenance repair mechanic.

The Industrial Automation part 1 certificate covers skills in: tools and testing methods for the automation industry, safety standards, robotic operation, and programming.

Item 3. Program Requirements

Includes course requirements and sequencing that reflect program goals. For degrees, the GE pattern and calculations used to reach the degree total must be shown following the program requirements table. Course titles and unit values must be exact.

Required Courses: 11-12 units

Course	Title	Units	Sequencing
SCA 1	Introduction to Automated Warehousing	4	
MAN 61	Robotics for Manufacturing	3	
ELE 10	Survey of Electronics	4	
Or			
ELE 77	Electrical Theory for Electricians	3	

Total Program Units: 11-12 units

Item 4. Master Planning

Must address how the certificate/degree fits in the mission, curriculum, and master planning of the college and higher education in California.

Item 5. Enrollment and Completer Projections
Projection of number of students to earn certificate/degree annually.

During the 2018-21 academic years we had 9 students CCC Annual average credentials at Norco College. By making changes to the certificate and splitting up the proposed certificate into three parts we are hoping to increase the number of students in the industrial automation program. Shown below is a graphic from the Centers of Excellence for labor market research five-year projections for the mechatronics occupational group there is a 7% change for new jobs. 23% of workers related to the profession are over 55 in our area. "In 2020, there were 1,762 total mechatronics jobs in the region. Employment for the community college-level mechatronics occupational group is projected to increase by 6% through 2025, with 58 combined annual job openings expected annually."

Summary

The Community College
Electro-Mechanical Technology
(TOP 0935.00)
Program

Provides training for the following Community College-level Occupations:
- **Electro-Mechanical and Mechatronics Technologists and Technicians**
(SOC 17-3024)
- **Electrical and Electronics Repairers, Commercial and Industrial Equipment**
(25-2011)

Over the next five years (2020-2025), community college-level mechatronics employment is projected to

Increase Employment
6%

58
combined
Annual Job Openings

Median Hourly Wage
$28.57 - $34.29
above the $24.36 hourly Self-sustainability Standard

45 Total Annual Awards
In Programs Related to Electro-Mechanical Technology

4
Program Awards in Electro-Mechanical Technology Programs

41
Program Awards in Programs Related to Mechatronics

Job Counts and Projections

In 2020, there were 1,762 total mechatronics jobs in the region. Employment for the community college-level mechatronics occupational group is projected to increase by 6% through 2025, with 58 combined annual job openings expected annually. Engineers, all other are expected 86 annual job openings, increasing employment by 6% over the next five years. Exhibit 1 displays the job counts, five-year projected job growth, job openings, and the share of incumbent workers age 55 years and greater in the region.

Exhibit 1: Five-year projections for the mechatronics occupational group, 2020-2025

Occupation	2020 Jobs	2025 Jobs	5-Yr % Change (New Jobs)	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
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Electro-Mechanical and Mechatronics Technologists and Technicians	46	50	7%	26	5	23%
Community College-level Total	**622**	**657**	**6%**	**289**	**58**	**18%**
Occupation	**2020 Jobs**	**2025 Jobs**	**5-Yr % Change (New Jobs)**	**5-Yr Openings (New + Replacement Jobs)**	**Annual Openings (New + Replacement Jobs)**	**% of workers age 55+**
Engineers, All Other*	1,139	1,204	6%	430	86	34%
Bachelor's Degree-level Total	**1,139**	**1,204**	**6%**	**430**	**86**	**34%**

Source: Emsi 2022.1

*Engineers, All Other includes the emerging, mechatronics engineers occupation among other engineering roles that cannot be quantified alone at this time. Demand for mechatronics engineers alone is likely overstated.

Item 6. Place of Program in Curriculum/Similar Programs

Must address how the certificate/degree fits in college's existing inventory.

The Industrial Automation program should be shown in the Manufacturing, Electronics and Electrician programs.

Many of the courses that are in this program are also in the Supply Chain Automation, Digital Electronics, and the Electrician programs. We will also be creating a new Robotics program that will have some of the courses that are in the Industrial Automation program.

Item 7. Similar Programs at Other Colleges in Service Area

Justification of need for certificate/degree in the region.

Examining the two graphics shown below from the Centers of excellence for labor market research Chaffey has a successful program in mechatronics, electrical systems, and power transmission technology with 32 annual average credentials for the academic years 2018-2021. The two programs at Chaffey college are divided into 3-4 levels like what we are proposing.

For a complete analysis of mechatronics educational supply in the region, programs similar in nature to mechatronics but assigned to different TOP codes were analyzed. The programs included in the supply analysis have been limited to those that provide training directly related to mechatronics. Exhibit 11 displays the mechatronics-related program titles and TOP codes and the types of awards offered by the colleges in the region.

Exhibit 11: Regional mechatronics and automation programs

College	Program Title	Program Code (TOP 4-digit)	Award Offered
Chaffey	Industrial Electrical Technology	Electrical Systems and Power Transmission (0934.40)	A.S. Degree
	Industrial Electrical Technology Level I	Electrical Systems and Power Transmission (0934.40)	Certificate of Achievement requiring 16 to less than 30-semester units
	Industrial Electrical Technology Level II	Electrical Systems and Power Transmission (0934.40)	Certificate of Achievement requiring 30 to less than 60-semester units
	Industrial Electrical Technology Level III	Electrical Systems and Power Transmission (0934.40)	Certificate of Achievement requiring 30 to less than 60-semester units
	Mechatronics	Electro-Mechanical Technology (0935.00)	A.S. Degree
	Mechatronics Level I	Electro-Mechanical Technology (0935.00)	Certificate of Achievement requiring 16 to less than 30-semester units
	Mechatronics Level II	Electro-Mechanical Technology (0935.00)	Certificate of Achievement requiring 8 to less than 16-semester units
Norco	Industrial Automation	Manufacturing and Industrial Technology (0956.00)	A.S. Degree; Certificate of Achievement requiring 16 to less than 30-semester units; Noncredit Program
	Supply Chain Automation	Manufacturing and Industrial Technology (0956.00)	A.S. Degree; Certificate of Achievement: 30 to less than 60-semester units
San Bernardino Valley	Industrial Automation	Industrial Systems Technology and Maintenance (0945.00)	Certificate of Achievement requiring 30 to less than 60-semester units
	Smart Systems Automation Technology	Electrical, Electronic, and Electro-Mechanical Drafting (0953.30)	Noncredit Program

Source: COCI, Community College Catalogs 2021-22

CENTERS OF EXCELLENCE FOR LABOR MARKET RESEARCH

Exhibit 12 displays the average annual credentials conferred from mechatronics training programs in the Inland Empire/Desert Region. Please note that the combination of completions from various training programs is intended to help assess the potential supply of mechatronics workers and does not provide an exact measure of trained mechatronics workers. These completion numbers do not reflect all competitions for each TOP code included, just the programs related to mechatronics within each TOP code.

Exhibit 12: Annual average community college credentials for programs related to mechatronics

Programs Related to Mechatronics	CCC Annual Average Credentials, Academic Years 2018-21
0934.40 – Electrical Systems and Power Transmission	
Chaffey	
Associate Degree	7
Certificate 30 to < 60 semester units	9
Certificate 18 to < 30 semester units	16
Electrical Systems and Power Transmission Total	**32**
0956.00 – Manufacturing and Industrial Technology	
Norco	
Associate Degree	4
Certificate 16 to < 30 semester units	5
Manufacturing and Industrial Technology Total	**9**
0965.00 – Industrial Systems Technology and Maintenance	
San Bernardino Valley	
Certificate 30 to < 60 semester units	0
Industrial Systems Technology and Maintenance Total	**0**
Mechatronics Programs Total	**41**

Source: LaunchBoard, MIS Data Mart, COCI

Item 8. Transfer Preparation Information (if applicable)

If transfer preparation is a component of the certificate/degree, please provide transfer preparation information.

None, this certificate does not transfer to any other colleges/universities currently.

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Program Outline of Record – Credit or Non-Credit Apprenticeships

Program Outline

Title: MANUFACTURING TECHNICIAN II (N) NAS967/NAS967B/NAS967C/NCE967

Originator: Paul Van Hulle **Date** 3/10/2023
Department: BEIT
College/Learning Pathway/Engagement Center: Norco - School of Science, Technology, Engineering & Mathematics

College: ☐ **Moreno Valley College** ☒ **Norco College** ☐ **Riverside City College**
(Please note: Apprenticeships are college specific. If multiple colleges wish to adopt this apprenticeship, a separate proposal and college specific supporting documents are required.)

TOPs Code: **CIP Code:**

Credit Type: ☒ Credit apprenticeship ☐ Non-credit apprenticeship

This is a: ☐ New apprenticeship* ☒ Modification to an existing apprenticeship

***New programs that require new facilities, positions, capital outlays, or have budgetary impacts must also be approved by Academic Senate and Strategic Planning before being submitted. Has this program been appropriately approved?**
☐ Yes, minutes attached ☐ Approval Pending
☐ No Capital or Budgetary Impacts

If this is a modification to an existing apprenticeship, please specify the changes being made:
(Please be specific! Indicate any changes such as title, learning outcomes, course changes, unit values, etc.)

Rationale:
(Please note: This information will be presented to the Board of Trustees.)

Required Documentation

Please submit this form and the documents outlined below to your college's Instructional Program Support Coordinator (IPSC) and the District Technical Review committee via TechReview@rccd.edu. Please do not submit your proposal until all of the documentation below is complete.

All new and modified program submissions must include the following:
☐ Evidence of district-wide discipline communication
☐ Department minutes showing approval
☐ Narrative *(see following page)*
☐ Labor Market Information and Analysis *(required for new apprenticeships and modifications)*
☐ Approval letter from the California Division of Apprenticeship Standards (DAS) *(required for new apprenticeships and modifications. The approval documentation must list the specific campus approved.)*

Program Narrative

Item 1. Program Goals and Objectives

Must address a valid workforce preparation purpose and may address transfer preparation.

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- **Apply industry standard safety practices and specific safety requirements for different machining operations**
- **Produce high precision parts out of a variety of conventional machine tools.**
- **Demonstrate advanced manufacturing technical practices and procedures that are applicable to all sectors of manufacturing.**
- **Demonstrate knowledge of CNC specific technical work practices, such as blueprint reading, applied math concepts, tools, and measurement concepts.**

Item 2. Catalog Description

Includes program requirements, prerequisite skills or enrollment limitations, program learning outcomes, and information relevant to program goal.

This program develops the fully qualified journey level Manufacturing Technician who has the ability to manufacture high precision parts out of a wide variety of materials using all types of conventional machine tools.

Item 3. Program Requirements

Includes course requirements and sequencing that reflect program goals.

Required Courses: 16 units

Course	Title	Units	Sequencing
APP 450	Apprenticeship Work Experience	16	

Elective Courses: 14-15 units

Course	Title	Units	Sequencing
DFT/ENE 30	Computer Aided Drafting (CAD)	3	
ENE 60	Math for Engineering Technology	3	
DFT/ENE 42	SolidWorks I	3	
DFT/ENE 51	Print Reading	2	
MAN 35	Computer Aided Manufacturing	5	
MAN 36	General Machine Shop and Theory of Machining	4	
ELE/MAN 55	Occupational Safety and Health Administration (OSHA)	1	
MAN 56	CNC Machine Set-up and Operation	4	
MAN 57	CNC Program Writing	3	

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Program Outline of Record – Credit Degrees and Certificates

Program Outline

Title: Industrial/Supply Chain Automation Technician III

Originator: Paul Van Hulle and Jesus Vela **Date** 2/23/2023

Department: BEIT/Manufacturing

College/Learning Pathway/Engagement Center: Norco - School of Science, Technology, Engineering & Mathematics

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TOPs Code: 0956.00 **CIP Code: ??**

Type of Program:
☒ Certificate of Achievement only ☐ Locally approved certificate (8-units or less) only
☐ Associate Degree only ☐ Certificate of Achievement and Degree

Type of Associate Degree: ☐ Associate of Arts ☐ Associate of Science

This is a: ☐ New certificate/degree* ☒ Modification to an existing certificate/degree

This is a modification to the Industrial Automation Certificate numbered NAS737/NAS737B/NAS737C/NCE737

***New programs that require new facilities, positions, capital outlays, or have budgetary impacts must also be approved by Academic Senate and Strategic Planning before being submitted. Has this program been appropriately approved?**

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Rationale:
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Item 3. Program Requirements

Includ… …t reflect program goals. For degrees, the GE pattern …ust be shown following the program requirements table.

		Units	Sequencing
		4	
		3	
		4	
	…ns	3	
		5	
		4	
	…Logic Controllers	3	
SCA 12	Introduction to Automation Networking	4	

Add Electricia mechanic

ELE/ELC 75	Solid State Devices and Lighting Controls	3	
MAN 67	Programmable logic controllers using Siemens	3	

Total Program Units: 31-32 units

Item 4. Master Planning
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Item 5. Enrollment and Completer Projections
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	Mechatronics Level II	Electro-Mechanical Technology (0935.00)	Certificate of Achievement requiring 8 to less than 16-semester units
Norco	Industrial Automation	Manufacturing and Industrial Technology (0956.00)	A.S. Degree; Certificate of Achievement requiring 16 to less than 30-semester units; Noncredit Program
	Supply Chain Automation	Manufacturing and Industrial Technology (0956.00)	A.S. Degree; Certificate of Achievement: 30 to less than 60-semester units
San Bernardino Valley	Industrial Automation	Industrial Systems Technology and Maintenance (0945.00)	Certificate of Achievement requiring 30 to less than 60-semester units
	Smart Systems Automation Technology	Electrical, Electronic, and Electro-Mechanical Drafting (0953.30)	Noncredit Program

Source: COCI, Community College Catalogs 2021-22

Exhibit 12 displays the average annual credentials conferred from mechatronics training programs in the Inland Empire/Desert Region. Please note that the combination of completions from various training programs is intended to help assess the potential supply of mechatronics workers and does not provide an exact measure of trained mechatronics workers. These completion numbers do not reflect all competitions for each TOP code included, just the programs related to mechatronics within each TOP code.

Exhibit 12: Annual average community college credentials for programs related to mechatronics

Programs Related to Mechatronics	CCC Annual Average Credentials Academic Years 2018-21
0952.10 - Electrical Systems and Power Transmission	
Chaffey	
Associate Degree	7
Certificate 30 to < 60 semester units	9
Certificate 18 to < 30 semester units	16
Electrical Systems and Power Transmission Total	**32**
0956.00 - Manufacturing and Industrial Technology	
Norco	
Associate Degree	4
Certificate 16 to < 30 semester units	5
Manufacturing and Industrial Technology Total	**9**
0957.60 - Industrial Systems Technology and Maintenance	
San Bernardino Valley	
Certificate 30 to < 60 semester units	0
Industrial Systems Technology and Maintenance Total	**0**
Mechatronics Programs Total	**41**

Source: Launchboard, MIS Data Mart, COCI

Item 8. Transfer Preparation Information (if applicable)

If transfer preparation is a component of the certificate/degree, please provide transfer preparation information.

None, this certificate does not transfer to any other colleges/universities currently.

RCCD | RIVERSIDE COMMUNITY COLLEGE DISTRICT
MORENO VALLEY COLLEGE | NORCO COLLEGE | RIVERSIDE CITY COLLEGE

Program Outline of Record – Credit Degrees and Certificates

Program Outline

Title: Industrial/Supply Chain Automation Technician II

Originator: Paul Van Hulle and Jesus Vela **Date** 2/23/2023

Department: BEIT/Manufacturing

College/Learning Pathway/Engagement Center: Norco - School of Science, Technology, Engineering & Mathematics

☐ **Moreno Valley College** ☒ **Norco College** ☐ **Riverside City College**
(Please note: All degrees and certificates are college specific. If multiple colleges wish to adopt this degree or certificate, a separate proposal and college specific supporting documents are required.)

TOPs Code: 0956.00 **CIP Code: ??**

Type of Program:
☒ Certificate of Achievement only ☐ Locally approved certificate (8-units or less) only
☐ Associate Degree only ☐ Certificate of Achievement and Degree

Type of Associate Degree: ☐ Associate of Arts ☐ Associate of Science

This is a: ☐ New certificate/degree* ☒ Modification to an existing certificate/degree

This is a modification to the Industrial Automation Certificate numbered NAS737/NAS737B/NAS737C/NCE737

***New programs that require new facilities, positions, capital outlays, or have budgetary impacts must also be approved by Academic Senate and Strategic Planning before being submitted. Has this program been appropriately approved?**
☐ Yes, minutes attached ☐ Approval Pending
☒ No Capital or Budgetary Impacts

If this is a modification to an existing certificate/degree, please specify the changes being made:
(Please be specific! Indicate any changes to title, description, learning outcomes, courses, unit values, etc.)

Rationale:
(Please note: This information will be presented to the Board of Trustees.)

RCCD | RIVERSIDE COMMUNITY COLLEGE DISTRICT
MORENO VALLEY COLLEGE | NORCO COLLEGE | RIVERSIDE CITY COLLEGE

Program Outline of Record – Credit Degrees and Certificates

Required Documentation

Please submit this form and the documents outlined below to your college's Instructional Program Support Coordinator (IPSC) and the District Technical Review committee via TechReview@rccd.edu. Please do not submit your proposal until all of the documentation below is complete.

All Degrees and Certificates

☐ Evidence of district-wide discipline communication
☐ Department minutes showing approval
☐ Narrative *(see following page)*
☐ Transfer preparation documentation *(only if applicable)*

Degrees and Certificates of 8 Units or More with Vocational TOPs Codes

In addition to the above, all degrees and certificates of 8 units or more with a vocational TOPs code must include the following to be submitted to the State Chancellor's Office for approval.*

☒ Labor Market Information and Analysis *(Required for new programs and modifications.)*
☐ Advisory Committee Recommendation *(Required for new programs and may be required for modifications. Check with the curriculum coordinator at your college to determine if a new recommendation is necessary.)*
☐ Regional Consortium Recommendation *(Required for new programs only.)*

**Certificates between 8 and less than 16 units can be approved locally or can be submitted to the State Chancellor's Office for approval. Certificates of less than 8 units can only be approved locally. However, locally approved certificates will not appear on student transcripts.*

Program Narrative

Item 1. Program Goals and Objectives

For programs with a vocational TOPs code, must address a valid workforce preparation purpose. For programs with a non-vocational TOPs code, must address a valid workforce preparation, basic skills, civic education, or local purpose. May address transfer preparation if applicable.

Upon successful completion of this program, students should be able to:
- Demonstrate knowledge of tools and testing methods for maintenance techniques.
- Apply maintenance fundamentals to simulated and actual workplace applications.
- Recognize, identify, and describe the functions of hand and power tools.
- Troubleshoot and repair a given, complex configuration of maintenance equipment

Item 2. Catalog Description

Includes program requirements, prerequisite skills or enrollment limitations, program learning outcomes, and information relevant to program goal.

The Associate in Science in the Industrial Automation program prepares students for jobs such as entry-level facility maintenance technician, field service technician, industrial maintenance technician, maintenance mechanic, or maintenance repair mechanic.

The Industrial Automation part 1 certificate covers skills in: tools and testing methods for the automation industry, safety standards, robotic operation, and programming.

Item 3. Program Requirements

Includes course requirements and sequencing that reflect program goals. For degrees, the GE pattern and calculations used to reach the degree total must be shown following the program requirements table. Course titles and unit values must be exact.

Required Courses: 22-23 units

Course	Title	Units	Sequencing
SCA 1	Introduction to Automated Warehousing	4	
MAN 61	Robotics for Manufacturing	3	
ELE 10	Survey of Electronics	4	
Or			
ELE 77	Electrical Theory for Electricians	3	
SCA 10	Industrial Automation 1	5	
ELE/MAN 74	Industrial Wiring and Controls	4	
MAN/ELE 64	Programmable Logic Controllers	3	

Total Program Units: 22-23 units

Item 4. Master Planning
Must address how the certificate/degree fits in the mission, curriculum, and master planning of the college and higher education in California.

Item 5. Enrollment and Completer Projections
Projection of number of students to earn certificate/degree annually.

During the 2018-21 academic years we had 9 students CCC Annual average credentials at Norco College. By making changes to the certificate and splitting up the proposed certificate into three parts we are hoping to increase the number of students in the industrial automation program. Shown below is a graphic from the Centers of Excellence for labor market research five-year projections for the mechatronics occupational group there is a 7% change for new jobs. 23% of workers related to the profession are over 55 in our area. "In 2020, there were 1,762 total mechatronics jobs in the region. Employment for the community college-level mechatronics occupational group is projected to increase by 6% through 2025, with 58 combined annual job openings expected annually."

Summary

The Community College **Electro-Mechanical Technology** (TOP 0935.00) Program

Provides training for the following Community College-level Occupations:

- **Electro-Mechanical and Mechatronics Technologists and Technicians** (SOC 17-3024)
- **Electrical and Electronics Repairers, Commercial and Industrial Equipment** (25-2011)

Over the next five years (2020-2025), community college-level mechatronics employment is projected to

Increase Employment 6%

58 combined Annual Job Openings

Median Hourly Wage **$28.57 - $34.29** above the $24.36 hourly Self-sustainability Standard

45 Total Annual Awards In Programs Related to Electro-Mechancial Technology

4 Program Awards in Electro-Mechanical Technology Programs

41 Program Awards in Programs Related to Mechatronics

Job Counts and Projections

In 2020, there were 1,762 total mechatronics jobs in the region. Employment for the community college-level mechatronics occupational group is projected to increase by 6% through 2025, with 58 combined annual job openings expected annually. Engineers, all other are expected 86 annual job openings, increasing employment by 6% over the next five years. Exhibit 1 displays the job counts, five-year projected job growth, job openings, and the share of incumbent workers age 55 years and greater in the region.

Exhibit 1: Five-year projections for the mechatronics occupational group, 2020-2025

Occupation	2020 Jobs	2025 Jobs	5-Yr % Change (New Jobs)	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
Electrical and Electronics Repairers, Commercial and Industrial Equipment	576	608	6%	263	53	17%
Electro-Mechanical and Mechatronics Technologists and Technicians	46	50	7%	26	5	23%
Community College-level Total	**622**	**657**	**6%**	**289**	**58**	**18%**
Occupation	**2020 Jobs**	**2025 Jobs**	**5-Yr % Change (New Jobs)**	**5-Yr Openings (New + Replacement Jobs)**	**Annual Openings (New + Replacement Jobs)**	**% of workers age 55+**
Engineers, All Other*	1,139	1,204	6%	430	86	34%
Bachelor's Degree-level Total	**1,139**	**1,204**	**6%**	**430**	**86**	**34%**

Source: Emsi 2022.1

*Engineers, All Other includes the emerging, mechatronics engineers occupation among other engineering roles that cannot be quantified alone at this time. Demand for mechatronics engineers alone is likely overstated.

Item 6. Place of Program in Curriculum/Similar Programs

Must address how the certificate/degree fits in college's existing inventory.

The Industrial Automation program should be shown in the Manufacturing, Electronics and Electrician programs.

Many of the courses that are in this program are also in the Supply Chain Automation, Digital Electronics, and the Electrician programs. We will also be creating a new Robotics program that will have some of the courses that are in the Industrial Automation program.

Item 7. Similar Programs at Other Colleges in Service Area

Justification of need for certificate/degree in the region.

Examining the two graphics shown below from the Centers of excellence for labor market research Chaffey has a successful program in mechatronics, electrical systems, and power transmission technology with 32 annual average credentials for the academic years 2018-2021. The two programs at Chaffey college are divided into 3-4 levels like what we are proposing.

For a complete analysis of mechatronics educational supply in the region, programs similar in nature to mechatronics but assigned to different TOP codes were analyzed. The programs included in the supply analysis have been limited to those that provide training directly related to mechatronics. Exhibit 11 displays the mechatronics-related program titles and TOP codes and the types of awards offered by the colleges in the region.

Exhibit 11: Regional mechatronics and automation programs

College	Program Title	Program Code (TOP Code)	Award Offered
Chaffey	Industrial Electrical Technology	Electrical Systems and Power Transmission (0934.40)	A.S. Degree
	Industrial Electrical Technology Level I	Electrical Systems and Power Transmission (0934.40)	Certificate of Achievement requiring 16 to less than 30-semester units
	Industrial Electrical Technology Level II	Electrical Systems and Power Transmission (0934.40)	Certificate of Achievement requiring 30 to less than 60-semester units
	Industrial Electrical Technology Level III	Electrical Systems and Power Transmission (0934.40)	Certificate of Achievement requiring 30 to less than 60-semester units
	Mechatronics	Electro-Mechanical Technology (0935.00)	A.S. Degree
	Mechatronics Level I	Electro-Mechanical Technology (0935.00)	Certificate of Achievement requiring 16 to less than 30-semester units
	Mechatronics Level II	Electro-Mechanical Technology (0935.00)	Certificate of Achievement requiring 8 to less than 16-semester units
Norco	Industrial Automation	Manufacturing and Industrial Technology (0956.00)	A.S. Degree; Certificate of Achievement requiring 16 to less than 30-semester units; Noncredit Program
	Supply Chain Automation	Manufacturing and Industrial Technology (0956.00)	A.S. Degree; Certificate of Achievement: 30 to less than 60-semester units
San Bernardino Valley	Industrial Automation	Industrial Systems Technology and Maintenance (0945.00)	Certificate of Achievement requiring 30 to less than 60-semester units
	Smart Systems Automation Technology	Electrical, Electronic, and Electro-Mechanical Drafting (0953.30)	Noncredit Program

Source: COCI, Community College Catalogs 2021-22

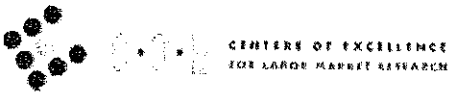

Exhibit 12 displays the average annual credentials conferred from mechatronics training programs in the Inland Empire/Desert Region. Please note that the combination of completions from various training programs is intended to help assess the potential supply of mechatronics workers and does not provide an exact measure of trained mechatronics workers. These completion numbers do not reflect all competitions for each TOP code included, just the programs related to mechatronics within each TOP code.

Exhibit 12: Annual average community college credentials for programs related to mechatronics

Programs Related to Mechatronics	CCC Annual Average Credentials, Academic Years 2018-23
0930.00 - Electrical Systems and Power Transmission	
Chaffey	
Associate Degree	7
Certificate 30 to < 60 semester units	9
Certificate 18 to < 30 semester units	16
Electrical Systems and Power Transmission Total	**32**
0960.00 - Manufacturing and Industrial Technology	
Norco	
Associate Degree	4
Certificate 16 to < 30 semester units	5
Manufacturing and Industrial Technology Total	**9**
0970.10 - Industrial Systems Technology and Maintenance	
San Bernardino Valley	
Certificate 30 to < 60 semester units	0
Industrial Systems Technology and Maintenance Total	**0**
Mechatronics Programs Total	**41**

Source: LaunchBoard, MIS Data Mart, COCI

Item 8. Transfer Preparation Information (if applicable)

If transfer preparation is a component of the certificate/degree, please provide transfer preparation information.

None, this certificate does not transfer to any other colleges/universities currently.

Program Outline of Record – Credit or Non-Credit Apprenticeships

Program Outline

Title: MANUFACTURING TECHNICIAN I (N) NCE968

Originator: Paul Van Hulle **Date** 3/10/2023
Department: BEIT
College/Learning Pathway/Engagement Center: Norco - School of Science, Technology, Engineering & Mathematics

College: ☐ **Moreno Valley College** ☒ **Norco College** ☐ **Riverside City College**
(Please note: Apprenticeships are college specific. If multiple colleges wish to adopt this apprenticeship, a separate proposal and college specific supporting documents are required.)

TOPs Code: **CIP Code:**

Credit Type: ☒ Credit apprenticeship ☐ Non-credit apprenticeship

This is a: ☐ New apprenticeship* ☒ Modification to an existing apprenticeship

***New programs that require new facilities, positions, capital outlays, or have budgetary impacts must also be approved by Academic Senate and Strategic Planning before being submitted. Has this program been appropriately approved?**

☐ Yes, minutes attached ☐ Approval Pending
☐ No Capital or Budgetary Impacts

If this is a modification to an existing apprenticeship, please specify the changes being made:
(Please be specific! Indicate any changes such as title, learning outcomes, course changes, unit values, etc.)

Rationale:
(Please note: This information will be presented to the Board of Trustees.)

Required Documentation

Please submit this form and the documents outlined below to your college's Instructional Program Support Coordinator (IPSC) and the District Technical Review committee via TechReview@rccd.edu. Please do not submit your proposal until all of the documentation below is complete.

All new and modified program submissions must include the following:

☐ Evidence of district-wide discipline communication
☐ Department minutes showing approval
☐ Narrative *(see following page)*
☐ Labor Market Information and Analysis *(required for new apprenticeships and modifications)*
☐ Approval letter from the California Division of Apprenticeship Standards (DAS) *(required for new apprenticeships and modifications. The approval documentation must list the specific campus approved.)*

Program Outline of Record – Credit or Non-Credit Apprenticeships

Program Narrative

Item 1. Program Goals and Objectives

Must address a valid workforce preparation purpose and may address transfer preparation.

Program Learning Outcomes:

Upon successful completion of this program, students should be able to:
• Students will apply industry standard safety practices and specific safety requirements for different machining operations.
• Students will be able to proficiently use equipment, machines, and technology in manufacturing processes.
• Knowledge of and ability to demonstrate general manufacturing technical practices and procedures that are applicable to all sectors of manufacturing.

Item 2. Catalog Description

Includes program requirements, prerequisite skills or enrollment limitations, program learning outcomes, and information relevant to program goal.

This provides students with a first step towards becoming a fully qualified journey level Manufacturing Technician. Through a combination of work-based learning, lectures and lab components, this program includes shaping and forming operations, materials handling, instrumentation and controls, and quality control, as well as computer-aided manufacturing and robotics. This program also includes optimization theory, industrial and manufacturing planning, and related management skills. Completion of this program prepares students for gainful employment as a machine operators, production technicians, CNC Programmers, industrial or manufacturing engineering technicians, or tool setter. To participate in this program, students must register as an apprentice and meet applicable program requirements.

Item 3. Program Requirements

Includes course requirements and sequencing that reflect program goals.

Required Courses: 8 units

Course	Title	Units	Sequencing
APP 450	Apprenticeship Work Experience	8	

Elective courses: 6-8 units

Course	Title	Units	Sequencing
DFT/ENE 30	Computer Aided Drafting (CAD)	3	
ENE 60	Math for Engineering Technology	3	
DFT/ENE 42	SolidWorks I	3	
DFT/ENE 51	Print Reading	2	
MAN 35	Computer Aided Manufacturing	5	

MAN 36	General Machine Shop and Theory of Machining	4	
ELE/MAN 55	Occupational Safety and Health Administration (OSHA)	1	
MAN 56	CNC Machine Set-up and Operation	4	
MAN 57	CNC Program Writing	3	

Item 4. Master Planning
Must address how the apprenticeship fits in the mission, curriculum, and master planning of the college and higher education in California.

Item 5. Enrollment and Completer Projections
Projection of number of students to earn apprenticeship annually.

Item 6. Place of Program in Curriculum/Similar Programs
Must address how the apprenticeship fits in college's existing program inventory.

Item 7. Similar Programs at Other Colleges in Service Area
Justification of need for apprenticeship in the region.

Item 8. Transfer Preparation Information (if applicable)
If transfer preparation is a component of the program, please provide transfer preparation information.

Discipline: Supply Chain Automation

Cross-listed Discipline: Transportation (Supply Chain Technology)

RIVERSIDE COMMUNITY COLLEGE DISTRICT INTEGRATED COURSE OUTLINE OF RECORD

SUPPLY CHAIN AUTOMATION 1

SCA-1 : Introduction to Automated Warehousing

College: NOR
Lecture Hours: 36.000
Lab Hours: 54.000
Outside-of-Class Hours: 72.000
Total Student Learning Hours: 162.000
Units: 3.00
Grading Methods: Letter Grade

Course Description

Prerequisite: None

Course Credit Recommendation: Degree Credit

An industrial technology overview course covering the basic knowledge and skills needed for supply chain technicians to successfully work in an automated distribution center. Introduction to the troubleshooting and maintenance of complex electromechanical systems is a major focus of this class. 36 hours lecture and 54 hours laboratory. Same as SCT-1.

Entrance Skills:

Before entering the course, students should be able to demonstrate the following skills:

Course Objectives:

Upon successful completion of the course, students should be able to demonstrate the following activities:

1. Introduce students to the tools and testing methods of the automation industry and the concepts of a safety culture in the workplace.

Student Learning Outcomes:

Upon successful completion of the course, students should be able to demonstrate the following skills:

1. **Articulate safety procedures related to working in a distribution center**
2. **Describe the functions performed by PLC's, scanners and label makers.**
3. **Describe correct scales, symbols and meanings used in diagrams and schematics.**
4. **Perform electro-mechanical systems repairs using appropriate troubleshooting methods.**

Course Content:

1. Workplace Safety
    a. Safety
    b. Personal Protective Equipment
    c. Lockouts and Tagouts
    d. Hazardous Materials
2. Maintenance Principles
    a. Preventative Maintenance
    b. Predictive Maintenance
    c. Troubleshooting

Discipline: Supply Chain Automation

Cross-listed Discipline: Industrial Technology (Industrial Automation)

RIVERSIDE COMMUNITY COLLEGE DISTRICT INTEGRATED COURSE OUTLINE OF RECORD

SUPPLY CHAIN AUTOMATION 10

SCA-10 : Industrial Automation 1

College: NOR
Lecture Hours: 54.000
Lab Hours: 54.000
Outside-of-Class Hours: 108.000
Total Student Learning Hours: 216.000
Units: 4.00
Grading Methods: Pass/No Pass
Letter Grade

Course Description

Prerequisite: None

Course Credit Recommendation: Degree Credit

An introduction to the principles of industrial automation technology, including basic functions, techniques, and tools used in warehousing and distribution centers and their role in logistics. Emphasis is placed on developing basic operations and maintenance competencies and introducing warehouse automated distribution center technology. Topics include safety, concepts concerning terminology, and operation of automated machines, tools, troubleshooting, blueprint analysis, measurement, electrical, pneumatic, and sensor operation. 54 hours lecture and 54 hours laboratory. (Same as IAT-10) (Letter grade or Pass/No Pass option)

Entrance Skills:

Before entering the course, students should be able to demonstrate the following skills:

Course Objectives:

Upon successful completion of the course, students should be able to demonstrate the following activities:

1. Apply industry safety principles.
2. Describe the role of technology in warehouses and distribution centers.
3. Apply methods and tools to read and interpret blueprint drawings.
4. Achieve applicable levels of skill regarding tools and measurements.

Student Learning Outcomes:

Upon successful completion of the course, students should be able to demonstrate the following skills:

1. **Demonstrate workplace safety procedures employed in warehousing and distribution centers, to include multi-level communication requirements.**
2. **Use industrial automation methods to achieve improvement in organizations using industrial technology.**
3. **Demonstrate knowledge of how to perform corrective, preventative, or predictive maintenance on industrial automation system using appropriate repair and troubleshooting methods.**

Course Content:

1. Career Awareness
2. Industry Certification
3. Supply Chain Principles

Discipline: Supply Chain Automation

RIVERSIDE COMMUNITY COLLEGE DISTRICT INTEGRATED COURSE OUTLINE OF RECORD

SUPPLY CHAIN AUTOMATION 12

SCA-12 : Introduction to Automation Networking

College: NOR
Lecture Hours: 54.000
Lab Hours: 54.000
Outside-of-Class Hours: 108.000
Total Student Learning Hours: 216.000
Units: 4.00
Grading Methods: Pass/No Pass
Letter Grade

Course Description

Prerequisite: None

Course Credit Recommendation: Degree Credit

Introduction to the principles of network systems in supply chain automation industry. Covers RSLinx, EtherNet/IP's, basic Programmable Logic Controller (PLC's), Variable Frequency Drives (VFD's), basic PLC Analog Inputs and Outputs. 54 hours lecture and 54 hours laboratory. (Letter grade, or Pass/No Pass option)

Entrance Skills:

Before entering the course, students should be able to demonstrate the following skills:

Course Objectives:

Upon successful completion of the course, students should be able to demonstrate the following activities:

1. Describe the function of programmable logic controllers (PLC) along with the different components of PLC systems.
2. Demonstrate how to wire and program PLC systems.
3. Describe the function and wiring of different Ethernet/IP communication systems for industrial networks.

Student Learning Outcomes:

Upon successful completion of the course, students should be able to demonstrate the following skills:

1. **Prepare technicians to maintain the automated material handling equipment and systems which support the supply chain.**

Course Content:

1. HMI Operations
    a. Function of an HMI Panel
    b. Parts of an HMI Panel
    c. Basic Operation of an HMI Panel
    d. How To Operate a PLC Project That Uses an HMI Panel
2. Programmable Controller Operation
    a. Function of a Programmable Logic Controller
    b. Basic Components of a PLC
    c. Types of PLC Programming Languages
    d. Basic Structure of a PLC Ladder Logic Program
    e. Basic Operation of a PLC
    f. Basic Components of Rockwell Studio 5000 PLC Software

NORCO COLLEGE

2023 Industry Partners & Awards Breakfast

OPEN TO FIELD TRIPS / TOUR OF PLANT

JUDY LOPEZ - 909-503-4010

MICRODYNE PLASTICS, INC.

1. WE WOULD LIKE TO BRING INTERNS IN FOR APPRENICESHIP PROGRAM (IN-HOUSE)
2. WE WOULD LIKE TO BRING IN PEOPLE TO DEVELOP AUTOMATION

* E-bench
  - Operator training
    - Basic tools, safety, goals
    - Maintenance tech internship/apprenticeship
  - Instrumentation, calibration, survey
  - Pressure vessel, Oven, Furnace,

Growing the workforce, together!

NORCO COLLEGE

2023 Industry Partners & Awards Breakfast

Victor De Freita (Collins Aerospace)

- Develop basic troubleshooting skills for electricians / mechanics.
- Develop advanced technical skills (PLC, Robotics, CNC, etc.) for Automation Engineers.
- Cover safety standards & requirements for equipment design.

Growing the workforce, together!

NORCO COLLEGE

2023 Industry Partners & Awards Breakfast

* Larry Boyer - Luxfer
626 260-3917

- PLC programming, troubleshoot
- Welding, fabrication
- CNC set-ups

Growing the workforce, together!

NORCO COLLEGE

2023 Industry Partners & Awards Breakfast

Diane Ramirez
Reborn Cabinets
dramirez@rebornCabinets.com
714 678 2303

- We are looking for trainees & apprentices
- possible offering our site location for a field trip (?)

Growing the workforce, together!

NORCO COLLEGE

2023 Industry Partners & Awards Breakfast

Collins Aerospace

- Instrumentation → electrical / mechanical classes
- Trouble shooting classes
- Measurements → imperial / metric
- Network connected ~~unconnected~~ equipment.
- Industrial Mechanic
  - → Rigging, hydraulics, shaft Alignment, pneumatics, welding, Motors, ball screws, bearings

Growing the workforce, together!

NORCO COLLEGE

2023 Industry Partners & Awards Breakfast

- PLC
- Servo motors
- HVAC - integrated into equipment
- ~~Pyrometry~~ Pyrometry
- Burners
- Gas meters / valves
- Piping / valves / water (gate valves; ball valves)
- Fire Systems

Growing the workforce, together!

NORCO COLLEGE

2023 Industry Partners & Awards Breakfast

- Control Valves
  - → 4-20 mA controls
  - → mA to psi controllers
  - - Water, Nitrogen, etc...
- Substation training
  - → Breakers, safety training
  - → troubleshooting
- Honeywell controllers
- Rails & bearing
- Racks & alignment

> Gantry machines

Growing the workforce, together!

NORCO COLLEGE

2023 Industry Partners & Awards Breakfast

- Instrument classes
  1. DMM
  2. Rotation meters (phase meter)
  3. Vibration Analysis tool
  4. Megger - insulation tester
  5. Calibrators (i.e. Fluke)
  6. Hygrometer
  7. Manometer
  8. Fluke Amp/Volt recorders
  9. Calipers
  10. Micrometers
  11.
- Thermocouples & testing

Growing the workforce, together!

NORCO COLLEGE

2023 Industry Partners & Awards Breakfast

Welding
- Tig
- Mig
- Torch
- Arc Weld

Transformers

Lasers : 20 Watt to 6 KWatt
- Safety
- trouble shooting

Growing the workforce, together!