# Minnesota North College-Mesabi, Eveleth Campus Electrical Controls and Maintenance

# Academic Year 2023-24 AAS Degree (72 credits)

FIRST YEAR FALL SEMESTER 2023 – 17 Credits		CREDITS	HOURS LEC/LAB
ECM 1244	Industrial Pneumatics	2	0/4
ECM 1252	Intro to Ethernet Networks	3	1/4
ECM 1264	Electrical and Electronic Theory	7	2/10
ECM 1276	Electrical/Mechanical Equipment and Systems	3	1/4
MATH 1130	Applied Technical Math	2	2/0
SPRING SEMEST	ER 2024 – 19 Credits		
ECM 1251	Programmable Logic Controllers	3	1/4
ECM 1260	Electrical Safety	1	1/0
ECM 1265	National Electrical Code	3	2/2
ECM 1266	Industrial Motor Control	6	2/8
ECM 1275	Introduction to Process Control	2	1/2
CHEM 1200	Introduction to Chemistry (MNTC 3 and 10)	4	3/2
SECOND YEAR FALL SEMESTER	2024 – 19 Credits		
ECM 2253	Automated Machine Control	6	0/12
ECM 2264	Automation Components and Equipment	3	1/4
ECM 2266	Temperature, Strain, and Analytical Instruments	3	1/4
ECM 2267	Pressure, Flow, and Level Instruments	3	1/4
PHYS 1211 or	College Physics 1 (MNTC 3) or	4	3/2
NSCI 1210	Physical Science (MNTC 3 and 10)		
SPRING SEMEST	ER 2025 – 17 Credits		
ECM 2276	Automated Process Control	7	1/12
ENGL 1231	College Composition 1 (MNTC 1)	4	4/0
SOC 2210	Human Relations (MNTC 5)	3	3/0
Electives from MNTC Goal Areas 5, 6, 7, or 9		3	

#### **PROGRAM DESCRIPTION**

The Electrical Controls and Maintenance program provides training in the areas of electrical maintenance, industrial electronics, process control, instrumentation, fluid power, electrical-mechanical systems, and integrated computer control.

The first semester of the program focuses on the fundamentals of electrical/electronic theory in lecture and practical applications performed in lab exercises. The second semester of the program teaches the basics of industrial control, including motor control, instrumentation/process control, programmable logic controllers, and the national electrical code. In the second year of the program, lecture-based lab work builds on the basics with additional technology continually being introduced.

## **PROGRAM OUTCOMES**

Upon completion of the Electrical Controls and Maintenance program, the graduate will be able to:

- 1. Secure entry level program related employment.
- 2. Resource information independently.
- 3. Learn and comply with safe work practices.
- 4. Accept the reality of ever advancing and changing technologies.
- 5. Demonstrate proficiency in the use of personal computers and other microprocessor-based devices.
- 6. Work cooperatively with faculty, staff, and fellow students to build as broad of a knowledge base as possible related to the field of electrical maintenance and industrial automation systems.

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#### **ARTICULATION AGREEMENTS**

• Minnesota State University, Moorhead - Operations Management

#### **PROGRAM NOTES**

• Differential tuition is assessed for the ECM courses.

## **EMPLOYMENT OPPORTUNITIES**

In order for industries to remain competitive, they must adapt to modern technology. Automation of equipment and processes is increasingly used to accomplish this goal. A need exists for personnel trained in servicing and maintaining high technology equipment. The job outlook for service and technical personnel is expanding. Opportunities exist in plant engineering/maintenance in almost all sectors of industry including paper/pulp, manufacturing, assembly, mining transportation, warehousing/distribution, utilities, graphics/publishing, chemical processing, and petroleum refining.

## **PROGRAM FACULTY**

Hoffman, Scott A 218-550-2607 Scott.hoffman@minnesotanorth.edu

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#### MISSION

Minnesota North College prepares lifelong learners and engaged citizens through inclusive, transformative experiences reflecting the character and natural environment of the region.

