Minnesota North College

PROGRAM PLANNER
ACADEMIC YEAR 2024-25

Electrical Controls and Maintenance

AAS Degree | 72 credits

Campus: Mesabi Range, Eveleth

FIRST YEAR FALL SEMESTER 2024 - 16 Credits		CREDITS	HOURS LEC/LAB
ECM 1245	Industrial Pneumatics	2	1/2
ECM 1255	Intro to Ethernet Networks	2	1/2
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 SEMESTER 2025 - 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 2025 - 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
ENGL 1231	College Composition 1 (MnTC 1)	4	4/0
SPRING SEMESTER 2026 - 18 Credits			
ECM 2276	Automated Process Control	7	1/12
ALHE 1100	Heartsaver First Aid with CPR and AED	1	1/0
PHYS 1211 or NSCI 1210	College Physics 1 (MnTC 3) or Physical Science (MnTC 3 and 10)	4	3/2
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 LEARNING 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.

ARTICULATION AGREEMENTS

- Minnesota State University, Moorhead: Operations Management
- Bemidji State University: Applied Engineering BAS
- Bemidji State University: Engineering Technology BS
- Bemidji State University: Project Management BS

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

Derek Moe
218-550-2614
Derek.moe@minnesotanorth.edu

AASC APPROVED: 03.28.22; DOC REV: 04.17.24