

# Electrical Controls and Maintenance

## A.A.S.

Articulation Agreement

MN State University – Moorhead –  
Operations Management, B.S.

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.



## Career 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.

**MESABI**  
*Range College*

[www.mesabirange.edu](http://www.mesabirange.edu)

**Enrollment Office - Eveleth Campus**  
1100 Industrial Park Dr., Eveleth, MN 55734  
218-744-7506 • 800-657-3860  
V/TTY: 218-744-7455

This document is available in alternative formats to individuals with disabilities by email – [d.lamppa@mesabirange.edu](mailto:d.lamppa@mesabirange.edu) or calling the Minnesota Relay Service at 1-800-627-3529.



**Minnesota**  
STATE COLLEGES  
& UNIVERSITIES

A MEMBER OF MINNESOTA STATE COLLEGES & UNIVERSITIES  
AN AFFIRMATIVE ACTION/EQUAL OPPORTUNITY  
EDUCATOR/EMPLOYER

**PROGRAM PLANNING FORM**

STUDENT \_\_\_\_\_

STUDENT ID \_\_\_\_\_

**ELECTRICAL CONTROLS AND MAINTENANCE**

**AAS**

Effective Semester/Year

(72 credits minimum)

Fall 2017

SEMESTER I		17 Credits	Cr	Lec/Lab	Grade
ECM 1233	Intro to Solid State Electronics		4	1 / 3	
ECM 1243	Intro to Digital Electronics		3	1 / 2	
ECM 1244	Industrial Pneumatics		2	0 / 2	
ECM 1253	Intro to DC/AC Electronics		4	1 / 3	
ECM 1295	Basic Soldering		1	0 / 1	
GEDM 1175	Applied Technical Math		2	2 / 0	
GECL 1155	College Seminar		1	1 / 0	
Total			17		

SEMESTER II		20 Credits	Cr	Lec/ Lab	Grade
ECM 1251	Programmable Logic Controllers		3	1 / 2	
ECM 1260	Electrical Safety		1	1 / 0	
ECM 1265	National Electrical Code		2	2 / 0	
ECM 1266	Industrial Motor Control		6	2 / 4	
ECM 1275	Introduction to Process Control		2	1 / 1	
ECM 1276	Electrical/Mechanical Equipment and Systems		2	0 / 2	
CHEM 1511	Fundamentals of Chemistry		4	3 / 1	
Total			20		

SEMESTER III		17 Credits	Cr	Lec/Lab	Grade
ECM 2252	Advanced Programmable Logic Controllers		4	1 / 3	
ECM 2264	Automation Components and Equipment		2	1 / 1	
ECM 2266	Temperature, Strain, and Analytical Instruments		3	1 / 2	
ECM 2267	Pressure, Flow, and Level Instruments		3	1 / 2	
GECL 2175	Job Search Strategies		1	0 / 1	
PHYS 1551	Introductory Physics or		4	3 / 1	
PHYS 1561	College Physics I or		4	3 / 1	
PHYS 1541	Physical Science		4	3 / 1	
Total			17		

SEMESTER IV		18 Credits	Cr	Lec/Lab	Grade
ECM 2235	Industrial Data Communications		4	2 / 2	
ECM 2276	Automated Industrial Control		5	0 / 5	
SOC 1558	Human Relations		3	3 / 0	
ENGL 1532	Technical Writing		3	3 / 0	
Electives	3 Credits From MTC Goal Areas 5,6,7 or 9		3		
Total			18		

Submitted 12/9/16

2/10/14

Approval by \_\_\_\_\_ Date \_\_\_\_\_

Approval by \_\_\_\_\_ Date \_\_\_\_\_