

Electrical Maintenance and Construction
Diploma | 75 credits

Campus: Hibbing

FIRST YEAR		CREDITS	HOURS	
FALL SEMESTER			LEC	LAB
ELM 1005	Electrical Math Applications	2	2	0
ELM 1101	DC Electrical Theory and Application	5	3	4
ELM 1201	AC/DC Electrical Circuits and Calculations	5	3	4
ELM 1301	Residential Wiring and Code 1	5	2	6
GENS 1170	Introduction to Computer Applications	1	0	2
TOTAL SEMESTER CREDITS		18		
SPRING SEMESTER				
ELM 1006 *	Algebra for Electricians	1	0	2
ELM 1102 *	AC Electrical and Electronic Theory and Applications	6	3	6
ELM 1202 *	Transformers, Generators, Alternators and Motors	6	3	6
ELM 1302 *	Residential Wiring and Code 2	6	2	8
TOTAL SEMESTER CREDITS		19		
SECOND YEAR				
FALL SEMESTER				
ELM 2101 *	Print Reading and Lighting Systems	5	2	6
ELM 2201 *	AC/DC Motor Control 1	5	2	6
ELM 2313 *	Renewable Energy Systems and House Project	6	2.5	7
COMM 1400	Communication for Career Success	3	3	0
TOTAL SEMESTER CREDITS		19		
SPRING SEMESTER				
ELM 2102 *	Commercial/Industrial Wiring Methods	5	2	6
ELM 2202 *	AC/DC Motor Controls 2	5	2	6
ELM 2311 *	Power Limited Circuits and Instrumentation	5	2	6
ELM 2405 *	Drones in Industry	2	1	2
WELD 1550	Welding for Electrical Maintenance and Construction	2	0	4
TOTAL SEMESTER CREDITS		19		
ELECTIVE				
ELM 1400	Attendance Make-up Project (variable credit)	1-3		

PROGRAM DESCRIPTION

The Electrical Maintenance program is unique in that it covers an array of employment opportunities in the electrical field. Electrical maintenance workers understand electrical theory in its many diverse applications from residential and commercial construction and maintenance to heavy industrial power and control installations. They apply the latest technology and codes to diagnose, test and repair electrical equipment including appliances, motors, generator, distributors, and control circuits.

PROGRAM LEARNING OUTCOMES

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

1. Perform work safely to industry standards including OSHA and 70E standards.
2. Meet the MN Department of Labor and Industry requirements, including maintaining a 95% attendance of all classes.
3. Perform all work to NEC standards and requirements.
4. Apply practical applications to AC and DC theory and circuits. Perform all work to NEC standards and requirements.
5. Install, maintain, and troubleshoot residential, commercial, and industrial electrical systems and equipment.
6. Install, maintain, and troubleshoot motor and motor control systems, including PLC's, VFD's, hard-wired, and human machine interface.

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7. Demonstrate knowledge of the installation and troubleshooting of renewable energy systems, including NABCEP entry-level task analysis.
8. Demonstrate knowledge of, install, and configure power limited circuits and systems, including fundamentals of instrumentation.

ACCREDITATION

Satisfactory completion of an approved two-year electrical program fulfills the one year's experience credit allowance (2000 hours) for a Class A journeyman electrician, power limited technician, or maintenance electrician license.

ARTICULATION AGREEMENTS

- Minnesota State University, Moorhead – Operations Management (Technical Management)
- Bemidji State University: Applied Engineering BAS
- Bemidji State University: Project Management BS, Construction and Facility Management

PROGRAM NOTES

- * Course has a prerequisite.
- Students are required to purchase their own tool set.
- All Electrical Maintenance classes are required to be student/instructor contact classes. No online classes are accepted.
- [Differential tuition is assessed for the ELM and WELD courses](#)

EMPLOYMENT OPPORTUNITIES

Graduates will qualify for employment with processing companies, industrial firms, large and small manufacturing companies, electrical contractors, power companies, and building construction companies. They may choose to do general electrical maintenance, install power and lighting systems, or work in instrumentation, automation, and solar/wind.

PROGRAM FACULTY

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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.*

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