North Central State College

MASTER SYLLABUS	2025-2026

A. Academic Division: Engineering Technology, Business & Criminal Justice Division

B. Discipline: Industrial Technology, Industrial Maintenance

C. Course Number and Title: EMMT1540 – Ladder Diagrams

D. Assistant Dean: Brooke Miller, M.B.A.

E. Credit Hours: 1
Laboratory: 3 hours

F. Prerequisites: EMMT1010

G. Last Course/Curriculum Revision Date: Fall 2025 Origin date: 02/10/2012

H. Textbook(s) Title: None

I. Workbook(s) and/or Lab Manual: Amatrol elearning modules.

J. Course Description: A study of the practical knowledge required to maintain and troubleshoot industrial control equipment properly by locating and properly identifying the nature and magnitude of a fault or error. This involves the understanding of electrical components, their symbols, and their relationships. Emphasis is placed on reading and understanding elementary ladder logic circuit diagrams based upon electrical standards, and above all else, promoting safety.

K. College-Wide Learning Outcomes

College-Wide Learning Outcome	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Identify control components by their schematic symbols.	Lab exercises, quizzes, midterm and final.
2. Identify logic circuits as a Boolean equation.	Lab exercises, quizzes, midterm and final.
3. Install, test and troubleshoot various industrial control circuits using Ladder Diagram schematics.	Lab exercises, quizzes, midterm and final.

Outcomes	Assessments – How it is met & When it is met
4. Classify input devices as to their environmental control function such as temperature, pressure, motion, flow, or light.	Lab exercises, quizzes, midterm and final.
5. Identify logical control functions, such as latches, interlocks, timing, counting, or sequential using ladder diagrams.	Lab exercises, quizzes, midterm and final.
6. Describe in detail the types of documentation used on a ladder diagram, such as, contact references, dashed and solid lines, component lettering, page references, and tables.	Lab exercises, quizzes, midterm and final.

M. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70-72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63-66	D	1.00	Below Average
60-62	D-	0.67	Poor
00-59	F	0.00	Failure

N. College Procedures/Policies:

North Central State College believes that every student is a valued and equal member of the community.* Every student brings different experiences to the College, and all are important in enriching academic life and developing greater understanding and appreciation of one another. Therefore, NC State College creates an inclusive culture in which students feel comfortable sharing their experiences. Discrimination and prejudice have no place on the campus, and the College takes any complaint in this regard seriously. Students encountering aspects of the instruction that result in barriers to their sense of being included and respected should contact the instructor, assistant dean, or dean without fear of reprisal.

* *Inclusive of race, color, religion, gender, gender identity or expression, national origin (ancestry), military status (past, present or future), disability, age (40 years or older), status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, genetic information, or sexual orientation*

Important information regarding College Procedures and Policies can be found on the syllabus supplement located at
https://ncstatecollege.edu/documents/President/PoliciesProcedures/PolicyManual/Final%20PDFs/14-081b.pdf

North Central State College

SYLLABUS ADDENDUM

Academic Division:	Engineering Technology, Business & Criminal Justice Division	**Discipline:**	Industrial Technology, Industrial Maintenance
Course Coordinator:	Dave Wright		
Course Number:	EMMT 1540	**Course Title:**	Ladder Diagrams
Semester / Session:	Spring 2026	**Start / End Date:**	01/12/2026 thru 05/08/2026

Instructor Information

Name:	Dave Wright	**Credentials:**	Master Electrician, BSBA
Phone Number:	419-755-4529	**E-Mail Address:**	Dwright@ncstatecollege.edu
Office Location:	Kehoe Center – IST Lab	**Office Hours:**	Tuesday & Thursday 7am to 7 pm

I. Topical Timeline / Course Calendar (Subject to Change):

Weeks	Topics	Assignment	Due Date
1	Systems Troubleshooting	Complete Amatrol Quiz, LAP, Skill Accomplishment	01/23/2026
2	Reversing Motor Control	Complete Amatrol Quiz, LAP, Skill Accomplishment	02/06/2026
3	Automatic Input Devices 1	Complete Amatrol Quiz, LAP, Skill Accomplishment	02/20/2026
4	Basic Timer Control: On-Delay and Off-Delay	Complete Amatrol Quiz, LAP, Skill Accomplishment	03/06/2026
5	Introduction to Electrical Control Wiring	Complete Amatrol Quiz, LAP, Skill Accomplishment	03/20/2026
6	Wiring Electrical Panels	Complete Amatrol Quiz, LAP, Skill Accomplishment	04/17/2026
7	Final Exam	Complete Amatrol Quiz, LAP, Skill Accomplishment	05/08/2026

II. Grading and Testing Guidelines:

Final Grade Calculation

Activity	Qty	Points	Percentage
Amatrol Quiz	5	100	20
LAP (learning activity pack)	5	100	50
Skill Accomplishment Test	5	100	10
Final Exam	1	100	20

There are 3 tasks that must be accomplished for each Topic:

1. Take the prequiz on the Amatrol LMS, Review the material, Take the quiz for that topic.
2. Complete the LAP (learning activity packet) on the trainer for your course. Have all exercises signed off by the instructor.
3. Complete the skill assessment for that topic.

III. Students are expected to work in a manner that is respectful of others. This includes avoiding loud or abusive language.