North Central State College

MASTER SYLLABUS	2025-2026

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

B. Discipline: Electronic Engineering Technology

C. Course Number and Title: EMMT2150 Motor Controls

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

E. Credit Hours: 2
Lecture: 1 hour
Laboratory: 2 hours

F. Prerequisites: None

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 methods and devices used to control and protect DC and AC motors on industrial machinery. The student will understand, develop, interpret, and troubleshoot ladder diagram circuits. The student will gain experience of DC Series, Shunt and Compound motors, single-phase motors, 3- motors, Stepper motors, Servos, and universal motors. The student will learn about OSHA safety regulations regarding Lockout/Tagout procedures and safe shut down procedures. The student will also wire control circuits that utilize soft-start techniques and dynamic braking techniques.

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, read, design, build and troubleshoot various relay and motor control circuits utilizing the different control devices required for correct operation of the desired circuit.	Homework, quizzes, labs throughout the semester, and final exam
2. Identify, describe and troubleshoot various overload protect circuits used in motor control circuits.	Homework, quizzes, labs throughout the semester, and final exam
3. Identify the proper NEMA enclosure type of use for a given electrical application.	Homework, quiz and exams. (week 3, 7, and 15)
4. Identify and describe the differences between a three-phase Wye and a three-phase Delta motor.	Homework, quiz, labs and exams. (week 6, 7, and 8)
5. Identify, read, design, build and troubleshoot different types of DC and AC motor reversing circuits.	Homework, quizzes, labs throughout weeks 4-10 and final exam
6. Identify, describe, built, test and troubleshoot various soft-start DC and AC motor control circuits	Homework, quizzes, labs throughout weeks 11 and 12 and the final exam
7. Identify, describe, build, test and troubleshoot various dynamic and passive braking systems used in DC and AC motor control circuits.	Homework, quizzes, labs throughout weeks 13 and 14 and the final exam.
8. Demonstrate the use of DVMs, clamp on ammeters, tachometers, and current transformers to troubleshoot motor control circuits	Throughout the semester in labs.
9. Demonstrate the use of DVMs clamp-on-ammeters, tachometers, torque meters, and watt meters to determine power factor, starting/stopping torque, inrush current, and running current.	Throughout the semester in labs.

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 2150	**Course Title:**	Motor Controls
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	Braking Methods / Reduced Voltage Starting Circuits	Complete Amatrol Quiz, LAP, Skill Accomplishment	01/23/2026
2	Power Generation and Distribution	Complete Amatrol Quiz, LAP, Skill Accomplishment	02/06/2026
3	Electronic Sensors	Complete Amatrol Quiz, LAP, Skill Accomplishment	02/20/2026
4	Timers and Counters / SCR Motor Control	Complete Amatrol Quiz, LAP, Skill Accomplishment	03/06/2026
5	Introduction to Variable Frequency AC Drives	Complete Amatrol Quiz, LAP, Skill Accomplishment	03/20/2026
6	Variable Frequency AC Drives - Speed and Torque Control	Complete Amatrol Quiz, LAP, Skill Accomplishment	04/03/2026
7	Variable Frequency AC Drives - Accel./Decel. and Braking	Complete Amatrol Quiz, LAP, Skill Accomplishment	04/17/2026
8	Variable Frequency AC Drives - Fault Diagnostics and Troubleshooting / 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	10	100	20
LAP (learning activity pack)	10	100	50
Skill Accomplishment Test	10	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.