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: EMMT2120 AC/DC Drives

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: 01/25/2018

H. Textbook(s) Title: None

I. Workbook(s) and/or Lab Manual: Amatrol E-learning AC/DC Drives

J. Course Description: This course covers an overview of DC and AC motors used in motion control and electronic devices and circuits used in DC and AC drives. Fixed output and phased controlled DC supplies needed for DC motor speed control and pulse width modulated (PWM) and variable frequency drive (VFD) inverters that provide AC motor speed control are also covered.

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. Demonstrate the ability to read motor diagrams and wire them correctly	Labs, final exam
2. Demonstrate knowledge of the fundamental operation of DC Drive systems.	Labs, final exam, Homework/e-learning
3. Demonstrate knowledge of the fundamental operation of Variable Frequency Drive systems.	Labs, final exam. Homework/e-learning

Outcomes	Assessments – How it is met & When it is met
4. Demonstrate knowledge of the fundamental operation of Servo and Stepper Drive systems.	Labs, final exam. Homework/e-learning
5. Demonstrate knowledge of AC Pulse Width Modulation	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 2120	**Course Title:**	DC / AC Drives
Semester / Session:	Summer 2026	**Start / End Date:**	05/26/2026 thru 07/17/2026

Instructor Information

Name:	Dave Wright	**Credentials:**	Master Electrician, BSBA
Phone Number:	419-755-4555	**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	INTRODUCTION TO DC MOTION CONTROL / BASIC DC DRIVES - SCR CONTROL	Complete Amatrol Quiz, LAP, Skill Accomplishment	05/26/2026
2	DC SPINDLE DRIVES / DC SERVO AXIS DRIVES	Complete Amatrol Quiz, LAP, Skill Accomplishment	06/05/2026
3	DC PULSE WIDTH MODULATION DRIVES	Complete Amatrol Quiz, LAP, Skill Accomplishment	06/12/2026
4	DC DRIVE TROUBLESHOOTING	Complete Amatrol Quiz, LAP, Skill Accomplishment	06/19/2026
5	Introduction to AC Variable Frequency Drives	Complete Amatrol Quiz, LAP, Skill Accomplishment	06/26/2026
6	Speed and Torque Control	Complete Amatrol Quiz, LAP, Skill Accomplishment	07/03/2026
7	Acceleration/Deceleration and Braking	Complete Amatrol Quiz, LAP, Skill Accomplishment	07/10/2026
8	AC Variable Frequency Drives - Fault Diagnostics and Troubleshooting / Final Exam	Complete Amatrol Quiz, LAP, Skill Accomplishment, Final Exam	07/17/2026

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.