North Central State College

MASTER SYLLABUS	2025-2026

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

B. Discipline: Mechanical Engineering Technology

C. Course Number and Title: MECT1750 Hydraulics and Pneumatics

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

E. Credit Hours: 3
Lecture: 2 hours
Laboratory: 2 hours

F. Prerequisites: None

G. Syllabus Effective Date: Fall, 2025

H. Textbook(s) Title:

Fluid Power and Applications
- Author: Esposito
- Copyright Year: 2008
- Edition: Seventh
- ISBN #: 9780135136904

I. Workbook(s) and/or Lab Manual: None; Class Handouts will be distributed

J. Course Description: This course will be based on learning today's Fluid Control Concepts that are important in die construction in the manufacturing area. In addition to system design and layout, the student will gain experience through labs using construction and operating systems. (TAG # OET009)

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. Explain forces on plane and curved boundaries.*	This material is covered in the first 3 Chapters, utilizing math, physical properties, and applications of fluid power. Homework – First half of term Midterm Final
2. Define piping systems and the dynamics of pipe flow.*	This material is covered in Chapters 3 and 4, concentrating on energy and power in hydraulic systems and frictional losses in piping. It is also covered in multiple lab exercises using hydraulic trainers. Homework – First half of term Midterm Final
3. Design piping systems involving friction, systems with laminar and turbulent flow.*	Different flows are covered in Chapter 4, introducing Reynolds number plus losses in valves and fittings. Hydraulic circuits are analyzed both in the classroom and in the lab. Homework & Labs – Throughout the term Midterm Final.
4. Understand the difference between absolute and gage pressures.*	Pressures are covered in almost every chapter, from the basics in Chapter 2 (abs and gage) as well as in other chapters and lab exercises when analyzing hydraulic circuits. Homework – Throughout the term Midterm Final.
5. Understand the principles of hydraulic power transmission.*	Hydraulic power transmission is covered in Chapters 3 through 10 and during lab exercises using hydraulic trainers. Homework – First half of term Midterm Final.
6. Understand Pascal's Law.*	Material is covered in Chapter 3 and in lab exercises with hydraulic trainers. Homework – Throughout the term Midterm Final.
7. Understand Bernoulli's Equation.*	Material is covered in Chapter 3 specifically, and used in Chapter 4 while being exposed to frictional losses in hydraulic circuits. Homework – First half of term Midterm Final.
8. Understand the properties of fluids.*	Viscosity, density and bulk modulus are covered in Chapter 2 and during lab exercises comparing viscosities at various temperatures. Homework – Throughout the term Midterm 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%20PDF/14-081b.pdf

North Central State College

SYLLABUS ADDENDUM

Academic Division:	Eng. Tech, Business & Crim. Jus. D	**Discipline:**	Mechanical Engineering Tech.
Course Coordinator:	Alex West		
Course Number:	MECT-1750 CN2	**Course Title:**	Hydraulics and Pneumatics
Semester / Session:	Spring 2026	**Start / End Date:**	01/12/2026 thru 05/06/2026

Instructor Information

Name:	Alex West	**Credentials:**	B.S. Mechanical Engineering
Phone Number:		**E-Mail Address:**	awest@NCStateCollege.edu
Office Location:	003	**Office Hours:**	Thursday 12:30 ~ 1:30 & Friday by Appointment

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

Weeks	Topics	Assignment	Due Date
1	Class Introduction and Layout		
2	Intro to Hydraulics	Intro to Hydraulics Homework	Week 3
3	Pneumatic Power	Pneumatic Power Homework	Week 4
4	Intro to Pneumatics	Quiz	Week 4
5	Hydraulic Pumps	Hydraulic Pumps Homework	Week 6
6	Pneumatic Flow	Pneumatic Flow Homework	Week 7
7	Test 1		Week 7
8	Spring Break		Mar. 6
9	Basic Hydraulic Circuits	Quiz	Week 9
10	Basic Pneumatic Circuits	Quiz	Week 10
11	Hydraulic Pressure & Flow	Hydraulic Pressure Homework	Week 12
12	Pneumatic Pressure & Flow	Pneumatic Pressure Homework	Week 13
13	Test 2		Week 13
14	Hydraulic Pressure Concepts	Quiz	Week 14
15	Hydraulic Flow Control	Hydraulic Flow Control Homework	Week 16
16	Pneumatic Flow & Speed Control	Quiz	Week 16
17	Hydraulic Sequence Controls	Quiz	Week 17
18	Test 3		Week 18

II. Grading and Testing Guidelines:

Final Grade Calculation

Activity	Qty	Points	Percentage
In Class Labs	10	20 ea	30
Homework Assignments	7	25 ea	20
Quizzes	6	20 ea	20
Tests	3	100 ea	30

Course Number: _____ **Course Title:** _____
Semester / Session: _____ **Start / End Date:** _____

III. Examination Policy:

1. The reasons for which a student will be excused from taking an examination _____
   a. Hospitalization (with documented verification)
   b. Death in the immediate family (with documented verification)
   c. Personal illness or illness in immediate family - (doctor's excuse required).
2. A student who misses an examination for any reason is responsible for _____
   a. Upon return to class, see the instructor about making up examination.
   b. No makeup times will be allowed unless you make prior arrangements with your instructor!
3. No makeup opportunity will be given for absences of unscheduled quizzes.

IV. Class Attendance and Homework Make-Up Policy:

1. Class attendance is necessary to acquire the knowledge required to _____
   a. ensure the commitment to student success, attendance must be taken in all classes, regardless of modality, starting with the first day of the class. This is mandated by regulations established by the Department of Education and the Veterans Administration. Faculty are required to keep accurate records of attendance, and
   b. Students are required to attend class and participate in their learning. Failure to attend class and/or participate in their learning may result in students being withdrawn from the class.
2. Students are responsible for _____
   a. Students are expected to attend and participate in their classes; therefore, faculty must monitor student attendance and participation and incorporate these requirements into their course syllabi.
   b. Student engagement is based on the "active pursuit" of learning which can be measured by class attendance, class participation (in class or online), taking required quizzes/examinations, and submission of work assignments or papers.
   c. Unless otherwise noted, homework assignments are due one week from the date assigned. I will accept late work up to one week after the due date with a 10% deduction. There are no make-ups for missing in-class assignments.

V. Classroom Expectations:

As a NC State Student, be it online or hybrid, your conduct in this course is subject to the NC State Student Code of Conduct. (Links to an external site.) As a future professional in your field, you will be expected to conduct yourself as a professional in this course in ALL work and communications - be it assignments, discussion forums, Canvas Inbox, emails etc. This includes but is not limited to:

1. Being respectful of classmates' opinions, work and comments
Good test = Is this something I would/should say to a co-worker in person?
2. Being respectful in communications with the instructor
Good test = Is this something I would/should say to my boss in the workplace?
3. Being respectful
Good test = Is this a comment/joke that is at some other groups, ethnicity, political etc. expense? Note: Offensive "jokes", slurs or hate speech (Links to an external site.) will NOT be tolerated
4. Using Non-Profane, Appropriate Language
Good test = Is this language you would use in the workplace or in front of your grandmother?
5. Using proper. NON-"Text speak" Language to make Yourself Easily Understood Good test = Could my older boss understand what I have written?
6. Failure to conduct yourself as a professional and meet standards above in this course will result in the following consequences in this course: