



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: MECT4010 Applied Fluid Mechanics

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

E. Credit Hours: 4
Lecture: 3 hours
Lab: 2 hours

F. Prerequisites: MECT 1750, MATH 1151

G. Last Course/Curriculum Revision Date: Fall 2025 Origin date: 09/26/2018

H. Textbook(s) Title:

Applied Fluid Mechanics

- Authors: Mott, Untener
- Copyright Year: 2014
- Edition: 7th Edition
- ISBN: 9780132558921

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

J. Course Description: This course explores the fundamentals of fluid statics and dynamics including differential analysis, dimensional analysis and similitude, laminar and turbulent flow, viscosity and boundary layer concepts, and compressible flow. Students will apply these principles to practical, applied problems such as; flow of fluids in pipes and conduits, pump selection and application, the design and analysis of HVAC ducts as well as Drag and Lift.

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:



North Central State College
SYLLABUS ADDENDUM

Academic Division:	Engineering Technology, Business & Criminal Justice Division	Discipline:	Mechanical Engineering Technology
Course Coordinator:	Brooke Miller		
Course Number:	MECT-4010	Course Title:	Applied Fluid Mechanics
Semester / Session:	Fall 2025/ Session B	Start / End Date:	10/13/2025 thru 12/12/2025

Instructor Information

Name:	Hemanta Dulal	Credentials:	MS in Mechanical Engineering
Phone Number:	419-755-4702	E-Mail Address:	hdulal@ncstatecollege.edu
Office Location:	Kehoe Center Room 005	Office Hours:	By Appointment (MW 1:45-5:00PM)

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

Weeks	Topics	Assignment	Due Date
1	Pressure measurement, Compressibility, Viscosity, Static Fluid Forces, Buoyancy	Homework-1	
2	Bernoulli's principle, Fluid Systems Energy Equations, Flow Types	Homework-2	
3	Review & Exam-1, Velocity Profiles, Minor Losses in Fittings	Homework-3	
4	Series Pipeline Systems, Parallel Pipeline Systems	Homework-4	
5	Pump Types, Performance, Pump Selection, Review & Exam-2	Homework-5	
6	Open Channel Flow, Flow Measurements, Forces due to Fluids in Motion	Homework-6	
7	Lift and Drag, Gas Flow and Pressure in Pipes, Gas Flow in Ducts	Homework-7	
8	Review, Final		

II. Grading and Testing Guidelines:

Final Grade Calculation

Activity	Qty	Points	Percentage
Homework/Quizzes			20%
Mid-term			30%
Final			30%
Lab			20%

III. Examination Policy:

- The reasons for which a student will be excused from taking an examination _____
 - Hospitalization (with documented verification)
 - Death in the immediate family (with documented verification)
 - Personal illness or illness in immediate family - (doctor's excuse required).
- A student who misses an examination for any reason is responsible for loss of the points.
- No makeup opportunity will be given for absences of unscheduled quizzes.

IV. Class Attendance and Homework Make-Up Policy:

Attendance Requirements: All students are required to attend all scheduled classes and examinations. Each faculty member has the right to establish regulations regarding attendance that he/she considers necessary for successful study.

Course Number: _____
Semester / Session: _____

Course Title: _____
Start / End Date: _____

Students who do not attend classes may be administratively withdrawn from those classes. However, failure to attend classes does not constitute withdrawal, and students are expected to process a formal withdrawal through the Student Records Office in Kee Hall.

V. Classroom Expectations:

As a NC State Student, be it 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:

- **Being respectful of classmates' opinions, work and comments**
Good test = Is this something I would/should say to a co-worker in person?
- **Being respectful in communications with the instructor**
Good test = Is this something I would/should say to my boss in the workplace?
- **Being respectful of diversity**
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
- **Using Non-Profane, Appropriate Language**
Good test = Is this language you would use in the workplace or in front of your grandmother?
- **Using proper. NON-"Text speak" Language to make Yourself Easily Understood**
Good test = Could my older boss understand what I have written?

Failure to conduct yourself as a professional and meet standards above in this course will result in the following consequences in this course:

- **1st Instance** = Written warning from the instructor documenting issue
(No points deductions)
- **2nd offense** = **Mandatory** meeting with the instructor and or Department Chair or Division Dean
(Related assignment/Participation subject to Point Deductions)
- **3rd offense:** College Disciplinary procedures filed with the NC State Judicial Committee as a violation of the Student Code of Conduct.
(Course Grade subject to F)

Extreme or repeated unprofessional behavior will result in initiating college disciplinary procedures as outlined in [the NC State Student Code of Conduct](#). [Links to an external site.](#) NCSC Disciplinary hearings can result in a variety of consequences, including and up to suspension or being expelled from the college.

Outcomes	Assessments – How it is met & When it is met
1. Demonstrate an ability to understand the principles of fluid friction as it applies to series, parallel, and branch flow systems.	Problem based quizzes and exams
2. Apply fluid mechanics to industry and commerce.	Problem based quizzes and exams
3. Design piping systems manually and with computer software.	Problem based quizzes and exams
4. Design air systems manually and with computer software.	Problem based quizzes and exams
5. work in teams to conduct laboratory experiments, analyze and interpret experimental data as well as produce written reports that are coherent and present the obtained results in a logical, convincing fashion.	Laboratory Reports

ABET Outcomes:

- *Outcome b.* Use of computer aided drafting and design software;
- *Outcome c.* Perform selection, set-up, and calibration of measurement tools/instrumentation;
- *Outcome f.* Material science and selection;
- *Outcome h.* Mechanical system design;
- *Outcome i.* Thermal sciences (such as thermodynamics, fluid mechanics, heat transfer, etc.);
- *Outcome l.* Technical communication typically used in preparation of engineering proposals, reports, and specification.

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>