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# MIDDLESEX COUNTY COLLEGE

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## COURSE SYLLABUS

<b>Department:</b>	Engineering Technologies
<b>Program:</b>	Mechanical Engineering Technology
<b>Course Number:</b>	MEC 204
<b>Title of Course:</b>	Fluid Mechanics
<b>Curriculum Coordinator:</b>	Rick Schieni
<b>Designation:</b>	Required Course

### **Course Description:**

A study of the basic principles of conservation of energy, continuity of flow, and fluid mechanics as related to fluid systems at rest and in motion. Laboratory Experiments provide hands-on experience in the set-up, operation, analysis and design of fluid systems. Computer software is used in several analysis and design projects. Oral presentation required.

### **Prerequisites (s):**

CIT 105 Statics for Technicians

### **Co-requisite (s):**

None

### **Textbook(s) and other required material:**

Applied Fluid Mechanics by Mott, Pearson, 7<sup>th</sup> Ed

### **Course objectives and their relationships to Student Outcomes:**

1. Apply the continuity equation, Bernoulli's equation, and the energy equation to the solution of fluid flow problems.
2. Apply the Darcy Equation and Moody Diagram to determine energy losses in piping systems. **(SO e)**
3. Analyze pump requirements and select appropriate pumps for various fluid systems. **(SO b)**
4. Apply fluid mechanics principles to size components in HVAC systems.
5. Collect, analyze and present data from laboratory experiments and design projects in the form of written reports and classroom presentations.

**Topics Covered:**

- The Nature of Fluids
- Pressure Measurement
- Flow Of Fluids & Bernoulli's Equation
- The Energy Equation
- Viscosity Of Fluids
- Reynolds Number: Laminar, & Turbulent Flow
- Friction Losses (Darcy Equation)
- Minor Losses
- Series Systems
- Pump Selection
- Flow Of Gases
- Flow Of Air In Ducts
- Forces on submerged object

**Class/laboratory schedule. Number of sessions each week and duration of each session:**

3 hours of lecture per week for 14 weeks

3 hours of laboratory per week for 14 weeks

**Criteria 5 Contribution: Technical Content**

<b>Prepared By:</b>	A. C. Stickler	<b>Date:</b>	3/29/08
<b>Updated By:</b>	A. C. Stickler	<b>Date:</b>	1/25/10 rev1
<b>Changes:</b>	Reworded outcomes 1 and 5		
<b>Updated By:</b>	A. C. Stickler	<b>Date:</b>	5/17/10 rev2
<b>Changes:</b>	Deleted LO 1: fluid properties must be understood in order to be able to achieve remaining LO's. Dropped pressurized gas item from HVAC item.		
<b>Updated By:</b>	A. C. Stickler	<b>Date:</b>	3/14/14 rev3
<b>Changes:</b>	Updated links between course learning outcomes and student outcomes to match 2014-2015 ABET criteria		
<b>Rev 4:</b>	General Update	<b>Date:</b>	3/15/21