Three Rivers Community College
MEC K270 Introduction to Fluid Mechanics
Syllabus
Spring 2011

Credit Hours: 3　　　　　　　　　　　　　　　　**January 21-May 16, 2010**
Lectures: Friday at 9:00-11:45 AM

Instructor	eMail Addresses	Phone	Office Hours
Philip C. Ross, Ph.D.	**pross@trcc.commnet.edu**	**Office 860-823-2820**	**by appointment**
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Course Description: This course introduces the mechanics of fluids. Basic characteristics of fluids, hydrostatics, pressure, centers of pressure, and pressure measuring devices are discussed. The application of the general energy equation to fluids in motion is also shown, along with the modifications necessary to introduce the effects of viscosity and friction on fluid flow, pressure heads, and pump calculations.

Learning Outcomes: The student will be able to:

- Determine pressures, forces and buoyancy of static fluids
- Apply continuity and energy equations to a variety of flow situations
- Analyze pipe head loss due to friction flow problems
- Predict viscosity and Reynold's number for various situations
- Calculate hydrodynamic forces due to mass flow and angles of flow

Lecture Textbook (required): Applied Fluid Mechanics, 4th edition, by Mott

Prerequisite: MATH 186, PHY 115　　**Co-requisite:** MEC 275

Vista blackboard: http://my.commnet.edu/ is the official location for assignments, grades, lecture notes and course information. The student will review their grades at this website to determine their ongoing grade status and to identify any missing materials that they need to make up.

Tests: The student is permitted two sheets of personal study notes, copies of the inside covers of the textbook and a graphing calculator during the test.

Grade Point Totals: *The four exams are worth 100 points each. Your average is determined by the sum of these, divided by 400.*

Attendance: Attendance will be recorded for both lectures and labs; these will be reviewed by the Electric Boat apprenticeship administrators to ensure compliance with this program. Attendance for scheduled tests is mandatory; make-up exams will be provided to the student if approved by both the Electric Boat apprentice program administrators and the instructor.

Grade equivalents:

A	93–100	B	83–86	C	73–76	D	63–66
A-	90–92	B-	80–82	C-	70–72	D-	60–62
B+	87–89	C+	77–79	D+	67–69	F	59 or less

Questions? You can speak with me after class, or phone or email me with questions or to schedule a meeting.

Learning Resources: In addition to tutoring available at Electric Boat, Three Rivers offers tutoring (http://www.trcc.commnet.edu/Div_academics/TASC/TASC.shtml) and other learning resources.

Academic Integrity Policy: Cheating on an exam, handing in another's work as your own, or falsifying records of laboratory or other data is a violation of the Three Rivers Academic Integrity Policy (http://www.trcc.commnet.edu/Div_StudentServices/StudentPrograms/PDF/TRCC-StudentHandbook.pdf).

Disabilities: If you have a hidden or visible disability which may require special classroom or testing modifications or special accommodations, please see me as soon as possible (http://www.trcc.commnet.edu/Div_StudentServices/LDResources/LDResources.shtml)

Course Topics (subject to change)

Hours   Topics (chapters)

Jan 21	Fluid Properties (ch 1 and 2) – pressure, compressibility, viscosity, Newtonian/Non-newtonian fluids
Jan 29	Pressure Measurement (ch 3) – absolute and gauge pressure, elevation, Pascal's Paradox
Feb 4	**Test 1 (chapters 1-3)**
Feb 11	Buoyancy (ch 5)
Feb 18	Fluid Flow (ch 6) – Flow velocity, continuity equation, Conservation of Mass, Conservation of Energy, velocity relationships, Bernoulli's equation
Feb 25	
Mar 4	**Test 2 (chapters 5 and 6)**
Mar 11	Reynold's Number (ch 8) – pipe flow, flow losses, velocity fields, boundary layer
Mar 18	**No Class (TRCC Spring Break)**
Mar 25	Head Loss (ch 9), venturi, orifice, flow devices
Apr 1	Branch pipes (ch 12)
Apr 8	**Test 3 (chapters 8, 9 and 12)**
Apr 15	Open Channel Flow (ch 13) – Moody's equation
Apr 22	**No Class**
Apr 29	Conservation of momentum (chapter 16) – hydrodynamic, impingement forces
May 6	Pumps: features and applications (chapter 15)
May 13	**Test 4**