## THREE RIVERS COMMUNITY COLLEGE COURSE OUTLINE - Fall 2013

## CRN 30205 M/W 3:00-4:40p Rm D-107

Instructor: Robert Lantz (RLANTZ@TRCC.COMMNET.EDU)

Course Number/Title: MEC K272 Fluid Mechanics/Thermodynamics Lecture 4 hrs Laboratory 0 hrs Credit 4 hrs Contact 4 hrs Course Description: To investigate the behavior of fluids/matter from a fluid mechanics and thermodynamics point of view. Method/Grading: The Course Grade will include Lecture Attendance, Submitted Homework, (3) In-Class Tests & In-Class Participation. Tests will be Open Book/Notes and will cover the entire Class Period. Text: Applied Fluid Mechanics, Mott; Introduction to Engineering Thermodynamics, Sonntag, & Handouts. TI-89 Calculator is Recommended. Prerequisites: PHY K115 Co-Requisites: COURSE TOPICS/CONTENT HOURS A. FLUID PROPERTIES Pressure head, buoyancy, flow velocity 10 B. CONSERVATION OF ENERGY Bernoulli's equation, venturi, orifice, flow devices, Friction energy loss. 10 C. CONTINUITY EQUATION Conservation of mass, velocity relationships 10 D. PIPE FLOW Viscosity, Reynold's number, flow losses, branch pipes 10 E. ENERGY EQUATION OF GASES Constant pressure, volume, temperature, adiabatic processes 9 F. BASIC ENGINE CYCLES Compressed air, internal combustion cycle, gas turbine, steam processes, Carnot cycle. 11 TOTAL HOURS 60 Date: August 26, 2013 Prepared By: Robert Lantz Program Coordinator: Patrick Knowles

Department Chairperson: Kent Harding

Course Number/Title: MEC K272 Fluid Mechanics/Thermodynamics

## Objective:

The Objective of this Course is to Understand and Predict how Matter will Respond when Acted upon by the following Natural Laws:

- 1) Law of Gravity
- 2) Force-Mass-Acceleration Law
- 3) Conservation of Energy Law
- 4) Conservation of Mass Law
- 5) Law of Kinetic Energy
- 6) Law of Potential Energy
- 7) Law of Internal Energy
- 8) Law of Flow Energy
- 9) Law of Work
- 10) Law of Power
- 11) Law of Friction Loss
- 12) Law of Heat

## Measurable Outcomes:

Upon Completion of this Course the Student will:

- Be able to determine pressures, forces, velocities and Buoyancy of static fluids
- Be able to apply continuity and energy equations to a variety of flow situations
- 3. Be able to determine pipe head loss due to friction flow problems
- 4. Be able to analyze engine cycles that involve constant pressure, temperature, volume or entropy. Also to understand the perfect gas laws.