

THREE RIVERS COMMUNITY COLLEGE
COURSE OUTLINE - Spring 2015
MEC K275 Thermal Science Lab
Robert Lantz (rlantz@trcc.comnet.edu)

Course Number/Title: MEC K275 Thermal Science Lab

Lecture 0 hrs Laboratory 2 hrs Credit 1 hrs Contact 2 hrs

Course Description: Selected labs from the fields of fluid mechanics, thermodynamics, and heat transfer

Method / Grading: Laboratory experiments & Reports

Text: None

Digication Requirement: All students are required to maintain an online learning portfolio in Digication that uses the college template.

Prerequisites: MAT-K254 Co-Requisites: MEC-K241 or MEC-K270 or MEC-K272

| COURSE TOPICS/CONTENT | HOURS |
|-------------------------------|-------|
| 1. Tank Flow | 3 |
| 2. Flow Meter Calibration | 3 |
| 3. Pump Efficiency | 3 |
| 4. Pump Lab | 3 |
| 5. Steam Turbine | 3 |
| 6. Orifice Calibration | 3 |
| 7. Orifice Flow Theoretical | 3 |
| 8. Venturi Flow Theoretical | 3 |
| 9. Counter flow Heat Transfer | 3 |
| 10. Conduction Heat Transfer | 3 |
| TOTAL HOURS | 30 |

Date: Jan 20, 2015

Prepared By: Robert Lantz

Program Coordinator: Patrick Kuoules

Department Chairperson: Patrick Kuoules

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Objective

The objective of this course is to demonstrate and calculate the principles of fluid flow. The net Objective is to prove that fluids adhere to the following mathematical rules and laws.

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

Measurable Outcomes

Upon completion of this course the student will be able to predict and calculate:

- 1) Mass Flow Rate (Lbm/Sec)
- 2) Volumetric Flow Rate (GPM)
- 3) Pressure, Temperature, Velocity & Height Values
- 4) Power Requirements (HP / Watts)
- 5) Efficiency of Processes (%)
- 6) Nusselt Number, Reynolds Number and Coefficient of Convection
- 7) Heat Transfer (Watts)
- 8) Heat & Friction Loss of Process (BTU / Watts)