HYDRAULICS I — HCEM 2135

A. Course Description
   - **Credits:** 3.00
   - **Lecture Hours/Week:** 1.00
   - **Lab Hours/Week:** 2.00
   - **OJT Hours/Week:** 0
   - **Prerequisites:** None
   - **Corequisites:** None
   - **MnTC Goals:** None

This introduction to basic hydraulics is a prerequisite to related courses. The student will study principles of hydraulics, identification of components, operation, fluids, and preventive maintenance. Students will use test instruments such as high-pressure gauges and flow meters to troubleshoot and diagnose hydraulic pump efficiency and condition of related system components. System components are disassembled and reassembled, with adjustments made to main and circuit reliefs in accordance with manufacturer's specifications. Prerequisites: HCEM1101 and HCEM1130 or instructor's approval

B. Course Effective Dates: 3/21/98 – Present

C. Outline of Major Content Areas
   - As noted on course syllabus

D. Learning Outcomes
   1. analyze hydraulic gear pump condition
   2. analyze hydraulic pump efficiency
   3. analyze vane pump condition
   4. assemble hydraulic gear pump
   5. assemble vane pump
   6. explain accumulator operation
   7. explain basic hydraulic system
   8. explain directional control valve operation
   9. explain double acting hydraulic cylinder operation
   10. explain electro-hydraulic operation
   11. explain gear type and vane type pump operation
   12. explain hydraulic motor operation
13. explain hydraulic preventative maintenance procedures
14. explain pilot operated operation
15. explain radial piston pump operation
16. explain single acting hydraulic cylinder operation
17. identify hydraulic fluids
18. identify hydraulic reservoirs
19. test gear pump output

E. **Minnesota Transfer Curriculum Goal Area(s) and Competencies**

F. **Learner Outcomes Assessment**
   As noted on course syllabus

G. **Special Information**
   None noted