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Iowa Lakes Community College is committed to ensuring that all programs and services, including electronic and our website (www.iowalakes.edu), are accessible to people with disabilities. In accordance with the provisions of Sections 504 and 508 of the Rehabilitation Act and the Americans with Disabilities Act (ADA), Iowa Lakes provides students, faculty, staff, and visitors with reasonable accommodations to ensure equal access to the programs and activities of the college. For more information visit: <https://www.iowalakes.edu/educational-counseling-services/accommodations-disability-resources>.

Patrick McCoy is an Associate Professor at Iowa Lakes Community College.

Updated in 2017, this course covers an introduction to basic hydraulic offered in credit programs in a face-to-face format.

Course Syllabus

Basic Hydraulics, EGT-146

Class Day/Time

Spring/2018

Iowa Lakes Community College
300 South 18th Street
Estherville, IA 51334

Instructor Name: J. Patrick McCoy
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Office Hours: As posted on office door

Catalog Description: This course will introduce students to the basic structure and application of hydraulics. Students will also learn how to read hydraulic schematics and troubleshoot basic hydraulic components.

This workforce solution is funded in part by the IHUM Consortium which is 100% financed through a \$15,000,000 grant from the U.S. Department of Labor's Employment & Training Administration.

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Prerequisites:

Credits: 3 (2 Lecture, 1 Lab)

Text & Additional Materials: Klette, Patrick. 2014. Fluid Power Systems. ATP; Lab-Volt Hydraulics Fundamentals.

Course Objectives:

To introduce students to the characteristics of hydraulics and hydraulic systems. Students will learn to identify, schematic symbols and hydraulic components. Students will also be introduced to the characteristics of a working hydraulic system that will enable them to start building troubleshooting skills through use of a hydraulic laboratory.

Competencies:

1. Define fluid power
2. Identify fluid power acronyms
3. Define Density, Specific Weight and Gravity
4. Demonstrate Viscosity, Thermal Points, and Properties
5. Define the types of liquids
6. Identify contamination of fluids
7. Demonstrate the nature of fluid and pressure
8. Define work, energy and power
9. Demonstrate pressures of fluids in a column
10. Identify a vacuum
11. Demonstrate a barometer and lifting capability of a pump
12. Demonstrate net positive suction head
13. Define continuity and types of flow
14. Define energy in liquids, Bernoulli's equation, Torricelli's Theorem
15. Demonstrate flow measurement, fluid power
16. Define losses due to friction
17. Identify components and their uses
18. Demonstrate a single and multi-piston system

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19. Demonstrate pump unloading and Accumulator circuits
20. Identify elements of a typical control system and sensors
21. Demonstrate the use of controllers, logic circuits, actuators and automation

Course Schedule/Outline (Units of Instruction):

1. Hydraulic Fundamentals
2. Fluid Conductors and Connectors
3. Hydraulic Pumps
4. Directional Control
5. Flow Control
6. Hydraulic Actuators
7. Pressure Control
8. Hydraulic Fluid Maintenance
9. Fluid Power Systems Electrical Control
10. Fluid Power Maintenance and Troubleshooting

Methods of Instruction: Course will be covered by two weekly hours of lecture and discussion based on reading assignments, site visits, guest speakers and other methods to be determined by instructor. There will also be two hours of laboratory work that will consist of demonstrations, experiments, research and other tasks that may be required by instructor.

Grading Policies:

Scale: **A** = 90 – 100%
 B = 80 – 89%
 C = 70 – 79%
 D = 60 – 69%
 F = 00 – 59%
(Note: Numerical marks will be rounded to the nearest integral value)

Grading is determined by total points earned for the semester.

Laboratory Reports: These reports are to be prepared and submitted individually, even though laboratories will be conducted in teams.

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Midterm Exam: One mid-term exam will be administered. This exam will cover the lecture and laboratory covered to that point in the semester.

Final Exam: A comprehensive final exam will be administered at the end of the semester during a scheduled exam period.

Other Expectations: Students will be expected to conduct themselves in a professional manor. Students are expected to attend all classes and labs. If unable to attend class or lab, Instructor must be notified in person, by phone or e-mail before absence occurs. Students who are excused by the instructor will be allowed to take exams at a pre-determined time.

Important: NO food or drinks in the lab.

Students must abide by all policies as stated in the Iowa Lakes Community College Student Handbook.

Students should be aware that classes might be audio or video recorded by one or more students. The college's policies governing the audio or video recording of class are included in the Student Handbook. Students who have any questions or concerns about class recordings should address their questions or concerns with the instructor at the *beginning of the semester*.

STUDENT ACADEMIC HONESTY POLICY

Iowa Lakes Community College believes that personal integrity and academic honesty are fundamental to scholarship. Iowa Lakes strives to create an environment where the dignity of each person is recognized and an atmosphere of mutual trust exists between instructors and students. The faculty has confidence in the integrity of the students and encourages students to exercise good judgment in fulfilling this responsibility.

Actions contrary to academic integrity will not be tolerated. Activities that have the effect or intention of interfering with learning or fair evaluation of a student's work or performance are considered a breach of academic integrity. Examples of such unacceptable activities include, but are not limited to:

- **Cheating** (intentionally using or attempting to use unauthorized material, assistance or study aids in my academic work). For example, using a cheat sheet for a test, looking at another student's paper during an exam, stealing or buying all or parts of an exam or paper, altering and resubmitting work for a better grade without prior approval to do so, etc.
- **Plagiarism** (representing another's ideas, words, expressions or data in writing or presentation without giving proper credit, failing to cite a reference or failing to use proper documentation, using works of another gained over the Internet and submitted as one's own work).
- **Falsification and/or misrepresentation of data** (submitting contrived or made-up information in any academic exercise). For example, making up data, citing non-existent sources, etc.
- **Facilitating Academic Dishonesty** (knowingly helping or attempting to help another violate any provision of the academic honesty policy). For example, working together on a take-home exam or other assignment when the option has not been made available, giving a paper/assignment to another student for his/her use, etc.

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- **Multiple Submissions** (submitting, without prior approval from the instructor involved, any work submitted to fulfill academic requirements in another class). For example, submitting the same paper for two different classes, etc.
- **Unfair Advantage** (trying to gain unauthorized advantage over fellow students). For example, gaining or facilitating unauthorized access to exam materials (past or present); interfering with another student's efforts in an academic exercise; lying about the need for an extension on a paper or assignment; destroying, hiding, removing or keeping library materials, etc.

Disciplinary Action

Any violation of this policy will be treated as a serious matter. The instructor has primary responsibility over classroom behavior and maintaining academic integrity. Students who earn an "F" based on any violation of the Student Academic Honesty Policy may not withdraw from the class (and receive a grade of W). Depending on the nature and severity of the offense, Iowa Lakes Community College reserves the right to exercise disciplinary action as outlined in the Disciplinary Action Section of the Student Handbook.

Americans with Disabilities Act – Policy of Nondiscrimination

It is Iowa Lakes Community College policy to not discriminate against qualified individuals with disabilities and to provide reasonable accommodation(s), as required by law, to otherwise qualified applicants for admission or to students with disabilities in all education programs, activities, services and practices, including application procedures, admissions, course selection, the awarding of degrees, discipline and dismissal. Educational opportunities will not be denied to an otherwise qualified application or student because of the need to make reasonable accommodation(s) or modification(s) for the physical and mental impairment(s) of any such individual.

Iowa Lakes Community College students needing reasonable accommodation(s) and/or modification(s) should contact Jody Condon by phone at (712) 852-5219 or via email at jcondon@iowalakes.edu. To assure that accommodation(s) and/or modification(s) will be ready when classes start, students must make the request as soon as possible, before a semester begins.

It is the policy of Iowa Lakes Community College not to discriminate on the basis of sex, race, national origin, creed, age, marital status or disability in its education programs, activities, or employment policies, as required by Titles VI and VII of the 1964 Civil Rights Act, Title IX of the 1972 Educational Amendments, Section 504 of the Federal Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act (ADA) of 1990.

Inquiries regarding compliance with Title IX, Title VI, Title VII, or Section 504 may be directed to Kathy Muller, Human Resources, Iowa Lakes Community College, 19 S. Seventh Street, Estherville, IA 51334, telephone (712) 362-0433; to the Director of the Iowa Civil Rights Commission, Des Moines; or to the Director of the Region VII Office of Civil Rights, Department of Education, Kansas City, Missouri.

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