Angelina College
Technology and Workforce Development Division
HYDR 2330 Fluid Power System Design
General Syllabus

I. BASIC COURSE INFORMATION:

A. Course Description: Three hours credit. Advanced operation of control valves and their controls for open and closed loop systems. Topics include filtration requirements for hydraulic systems; operation of hydraulic circuits; design circuits, including hydraulics, pneumatics, electrical/electronic controls, and mechanical interface. Two lecture hours and three lab hours each week. Lab fee.

B. Intended Audience:
Sophomore

C. Instructor:
Office Location:
Office Hours:
Phone:
E-mail Address:

II. INTENDED STUDENT OUTCOMES:

A. Core Objectives Required for this Course

1. Critical Thinking: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

2. Communication: to include effective development, interpretation and expression of ideas through written, oral and visual communication

3. Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

B. Course Learning Outcomes for all Sections

1. Identify the fluid power symbols for control valves;
2. Fluid requirements for control valves;
3. Describe the operation of control valves;
4. Contrast open and closed loop control;
5. Describe symmetrical and nonsymmetrical spools;
6. Apply the use of constant torque motors;
7. Describe the operation of linear velocity displacement transformer (LVDT) in proportional valves;
8. Describe digital electrohydraulic devices;
9. Design a fluid power system.

III. ASSESSMENT MEASURES

A. Assessments for the Core Objectives:

1. **Critical Thinking**: Students will demonstrate the application of critical thinking skills by utilizing creative and appropriate evaluation and calculation methods to address the advanced operation of control valves for open and closed loop systems. A standard rubric is used to assess this objective.
2. **Communication**: Students will communicate hydraulic information using complete and correct notation and written and visual communication skills. A standard rubric is used to assess this objective.
3. **Empirical and Quantitative Skills**: Students will use empirical and quantitative skills to answer homework, laboratory and test questions. A standard rubric is used to assess this objective.

B. Assessments for Course Learning Outcomes

1. The student's ability to identify the fluid power symbols for control valves will be assessed through homework assignments, laboratory exercises and major exams.
2. The student's ability to recognize fluid requirements for control valves will be assessed through homework assignments, laboratory exercises and major exams.
3. The student's ability to describe the operation of control valves will be assessed through homework assignments, laboratory exercises and major exams.
4. The student's ability to contrast open and closed loop control will be assessed through homework assignments, laboratory exercises and major exams.
5. The student's ability to describe symmetrical and nonsymmetrical spools will be assessed through homework assignments, laboratory exercises and major exams.
6. The student's ability to apply the use of constant torque motors will be assessed through homework assignments, laboratory exercises and major exams.
7. The student's ability to describe the operation of linear velocity displacement transformer (LVDT) in proportion valves will be assessed through homework assignments, laboratory exercises and major exams.
8. The student's ability to describe digital electrohydraulic devices will be assessed through homework assignments, laboratory exercises and major exams.
9. The student's ability to design a fluid power system will be assessed through homework assignments, laboratory exercises, and major exams.

IV. INSTRUCTIONAL PROCEDURES:

This course is being delivered in a hybrid format. This means that approximately 50% of instruction and student participation activities will be delivered and submitted outside of the on-campus classroom through Blackboard. Content delivered outside of the on-campus classroom may include, video, audio, images and links to external websites. Students are encouraged to consult with their instructor, if additional instruction is needed. Lab activities are required in this course. The lab portion of the class appears on your schedule along with a room number. Attendance during the on-campus part of the course is mandatory. Completion of in-class work is also mandatory.

V. COURSE REQUIREMENTS AND POLICIES:

A. Required Textbooks and Recommended Readings, Materials and Equipment

Equipment – ANSI Z87.1 Clear Safety Glasses
Texas Instruments TI-30X II S Scientific calculator
Three ring notebook (2")
8.5 x 11 inch paper, pencils, pens

Text(s) – Industrial Hydraulics Manual, Sixth Edition, ISBN 978-0-692-53210-2 Eaton Corporation
Lightning Reference Handbook, Eighth Edition, Berendsen Fluid Power

B. Course Policies – This course conforms to the policies of Angelina College as stated in the Angelina College Handbook.

1. **Academic Assistance** – If you have a disability (as cited in Section 504 of the Rehabilitation Act of 1973 or Title II of the Americans with Disabilities Act of 1990) that may affect your participation in this class, you should see Maria Lopez or Steve Hudman in room 200 of the Student Center. At a postsecondary institution, you must self-identify as a person with a disability; Ms. Lopez and Mr. Hudman will assist you with the necessary information to do so. To report any complaints of discrimination related to disability, you should contact Mr. Steve Hudman, Dean of Student Affairs, in Room 101 of the Student Center. You may also contact Dean Hudman by phone at (936) 633-5292 or by email shudman@angelina.edu.

2. **Attendance –** Attendance is required as per Angelina College Policy and will be recorded every day. Any student with three (3) consecutive absences of four (4) cumulative absences may be dropped from the class. Records will be turned in to the academic dean at the end of the semester. Do not assume that non-attendance in class will always result in an instructor drop. **You must officially drop a class or risk receiving an F**. This is official Angelina College Policy.

3. **Student Conduct**
   Classroom behavior will not interfere with the instructor's ability to conduct the class or the ability of other students to learn from the instructional program. Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic, or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, etc. The instructor shall have full discretion over what behavior is

appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams will be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help AC students succeed.

Student Rights & Responsibilities
Abiding by college policy on academic integrity is a responsibility of all college faculty and students. Academic dishonesty includes both cheating and plagiarism. Cheating includes, but is not limited to (1) using or attempting to use electronic devices to access unauthorized materials on any assignment or exam; (2) falsifying or inventing any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another student in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism include, but are not limited to (1) submitting an assignment as if it were your work when it is at least partly the work of another person; (2) submitting work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into your paper without giving the author due credit. Please refer to Angelina College's, *College Catalogue* @ www.angelina.edu/wp-content/uploads/2014/03/17-18-final-20.pdf, which addresses student conduct and discipline program.

VI. COURSE OUTLINE: Description of the Course Activities including due dates, schedules, and deadlines.

At a minimum, there will be two tests and a final exam, which may be administered through Blackboard. Weekly assignments will be available through Blackboard throughout the course of the semester. Assignments will cover information relative to this course of study and a due date will be assigned to each assignment. Assignment materials must be completed and submitted prior to taking a scheduled test.

VII. EVALUATION AND GRADING:

Tests and assignments are delivered through both Blackboard and conventional methods. Each test and assignment is assigned a 100-point value. Your final grade for the class is the sum of the weighted averages of all Labs, Assignments, Tests, and Attendance. Attendance is counted as a test grade.

All students must complete the "Workplace Skills" online coursework through Aztec Software prior to applying for graduation. The Electromechanical Technology Advisory Committee members, who represent many of the employers in our area, identified this material to be beneficial.

The "Aztec Ready for Work Series focuses on the soft employability skills essential for the workplace beyond the basic academic skills. This series equips the learners with the necessary 21st century skills to prepare them for the workplace with confidence" (www.aztecsoftware.com/course/aztec-learning-series/).

Sample lessons included in this series:

- How to dress for an interview
- Getting along with your co-workers
- Following Directions
- Time Management
- Listening Skills
- Customer Service
- Writing for Work – Resume, Cover Letter

Determination of Course Grade:
Labs: 30%
Assignments: 30%
Tests and Attendance: 30%
Final Exam: 10%

Above 89.1	A
79.1 to 89	B
69.1 to 79	C
59.1 to 69	D
≤59	F

A. The instructor may modify the provisions of the syllabus to meet individual class needs by informing the class in advance as to the proposed changes.

B. As a student enrolled in a Technology & Workforce Division program, you will encounter certain risks while you are in a classroom, laboratory experience, or in a clinical or practicum setting. In the event that you sustain an injury and/or require any medical testing or care, all resulting medical expenses (hospital, ambulance, or physician fees), are your financial responsibility and not the responsibility of Angelina College or the clinical/practicum site.

C. Effective August 27, 2012, Angelina College prohibits the use of tobacco products on campus, except in your personal vehicle. This measure was approved by the College Board of Trustees, and includes smoking and smokeless tobacco products.