1. **COURSE TITLE\*:** Hydraulics and Pneumatics
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*:** ENDS 2205
3. **PREREQUISITE(S)\*:** PHYS 1117 or 2201 and MATH 1120 or higher **COREQUISITE(S)\*:** NONE
4. **COURSE TIME/LOCATION: (*Course Syllabus – Individual Instructor Specific*)**
5. **CREDIT HOURS\*:** 3 **LECTURE HOURS\*:** 2

**LABORATORY HOURS\*:** 1**(2** **contact hours) OBSERVATION HOURS\*:** 0

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

An introductory course to impart basic knowledge of hydraulic and pneumatic concepts, components and systems for power transmission and control, where laboratory work is performed using industrial components and circuits.

1. **LEARNING OUTCOMES\*:**
2. Explain forces on plain and curved boundaries.
3. Define piping systems and the dynamics of pipe flow.
4. Design piping systems involving friction, systems with laminar and turbulent flow.
5. Understand the difference between absolute and gage pressures.
6. Understand the principles of hydraulic power transmission.
7. Understand Pascal’s Law
8. Understand Bernoulli’s Equation
9. Understand the properties of fluid
10. **ADOPTED TEXT(S)\*:** *Fluid Power Hydraulics and Pneumatics*

Fourth Edition By: Daines, James R., Daines, Martha J.

The Goodheart-Willcox Company, Inc.

ISBN: 979-8-88817-443-2

**9a: SUPPLEMENTAL TEXTS APPROVED BY FULL TIME DEPARTMENTAL FACULTY (INSTRUCTOR MUST NOTIFY THE BOOKSTORE BEFORE THE TEXTBOOK ORDERING DEADLINE DATE PRIOR TO ADOPTION) \*\*\*.**

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.)\*\***
2. Laboratory Exercise Handouts will be furnished by SSCC.
3. Drafting Kit or AutoCAD,
4. Clothes for working in laboratory, Boots (at least no open toe shoes),
   1. One pair of safety glasses and ear protection will be provided by SSCC.

5) Scientific Calculator 6) Automation Studios software (free to students)

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

Points

A: 900 – 1000

B: 800 – 899

C: 700 – 799

D: 600 – 699

F: 0 – 599

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***

|  |  |  |
| --- | --- | --- |
| *`* | ***EXAMPLE ONLY***  *Total Points* | *% of Grade* |
| Assignments | 200 | 20% |
| Test x3 | 600 | 60% |
| Final Exam | 200 | 20% |
| Total | 1000 | 100% |

1. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

Lecture, independent and group projects and labs, in-class and home assignments, quizzes, tests may be used. This course is combination of in-class lecture, and hands-on laboratory applications, solving problems using methods including software, graphical and mathematical tools.

1. **COURSE OUTLINE: Sample- *(Course Syllabus – Individual Instructor Specific)***

|  |  |  |  |
| --- | --- | --- | --- |
| Module | WEEK | MATERIAL | LEARNING OUTCOMES |
|  | 1 | Chapter 1-Introduction to Fluid Power  Chapter 2- Fluid Power Systems | 1, 3, 6, 7 8 |
| 1 | 2 | Chapter 3- Safety and Health  Chapter 4- Basic Physical Principles | 1, 3 |
|  | 3 | Chapter 5- Fluid Power Standards and Symbols  Test 1 | 1, 2, 3, 5, 8 |
|  | 4 | Chapter 6- Hydraulic Fluid | 1, 2, 3, 5, 8 |
|  | 5 | Chapter 7- Source of Hydraulic Power  Lab | 1, 2, 3, 5, 8 |
|  | 6 | Chapter 8-Fluid Storage and Distribution | 1, 2, 3, 5, 8 |
|  | 7 | Chapter 9- Actuators  Lab |  |
|  | 8 | Chapter 10- Controlling the System  Lab | 1, 2, 3, 5, 6, 7, 8 |
| 2 | 9 | Chapter 11- Accumulators  Lab | 1, 2, 3, 5, 6, 7, 8 |
|  | 10 | Chapter 12- Conditioning System Fluid | 1, 2, 3, 4, 6, 7,8 |
|  | 11 | Chapter 13-Applying Hydraulic Power  Lab  Test 2 | 1, 2, 3, 4, 5, 6, 7,8 |
|  | 12 | Chapter 14- Compressed Air  Chapter 15- Source of Pneumatic Power  Lab | 1, 2, 3, 4, 6, 7,8 |
|  | 13 | Chapter 16- Conditioning and Distribution of Compressed Air  Chapter 17- Work Performs of Pneumatic Systems  Lab | 1, 2, 3, 4, 6, 7,8 |
| 3 | 14 | Chapter 18- Controlling a Pneumatic System  Chapter 19- Applying Pneumatic Power  Lab | 1, 2, 3, 4, 6, 7,8 |
|  | 15 | Test 3  Lab  Review | 1, 2, 3, 4, 6, 7,8 |
| FINAL | 16 | Comprehensive Final Exam, All Lab Reports due | 1-8 |

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

All assignments and tests must be turned in on time (See course syllabus and Canvas). Late work will receive a zero grade. Due dates will be on the syllabus handed out (or Canvas) in class on the first day. Students may work on their own time to complete the assignments. Laboratory exercises are assigned for the student to complete in teams during lab hours, with reports done by each student, individually, outside of class and lab hours.

Examinations can include written and graphical components.

Artificial Intelligence (AI) is not permitted (Calculators, Grammarly, and spell checkers are okay) to be used with any written reports or discussions.

**16. FERPA:** Students need to understand that their work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks. First offence- zero for assignment, second offence- failure of course. All will be reported to the records office and put in your records.

**17. ACCOMMODATIONS: \***

Students requesting accommodations may contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431, X 2604.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires an accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first. For more information about Religious Accommodations, contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431 X 2604.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.