

FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER:	EST 1700
COURSE TITLE:	Hydraulics and Pneumatics
PREREQUISITE(S):	None
COREQUISITE(S):	None
CREDIT HOURS:	3
CONTACT HOURS/WEEK:	4
CONTACT HOUR BREAKDOWN:	
Lecture/Discussion:	3
Laboratory:	1
Other:	
FACULTY WORKLOAD POINTS:	3.67
STANDARDIZED CLASS SIZE ALLOCATION:	24
CATALOG COURSE DESCRIPTION:	
	Introduction to the theory and operation of hydraulic and pneumatic systems involving the principles, components, symbols, and applications will be included from both a systems development and troubleshooting context. Special emphasis will be placed on hydraulic and pneumatic components, flow diagrams for particular applications, when used with Computer Integrated Manufacturing techniques. This course also includes troubleshooting procedures for systems, system components, and manufacturing assemblies taught in a systematic manner.
SUGGESTED TEXT (S):	<u>Introduction to Fluid Power</u> , by James L. Johnson, Delmar - Thomson Learning Publisher. ISBN: 07668-2365-2
IMPLEMENTATION DATE:	Summer Term, 2002 (20023)
REVIEW/MODIFICATION DATE:	Fall Term, 2002 (20031) Fall Term, 2009 (20101) - Proposal 2009-11

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Fundamentals of Hydraulics and Pneumatics - Introduction to Fluid Power Theory	30
A. Hydraulic Applications	
B. Hydraulic Symbols	
C. Hydraulic Components	
D. Basic Hydraulic Systems	
E. Hydraulic Circuits	
F. Hydraulic Pumps	
G. Hydraulic Receivers	
H. Determining Causes of Failures	
1. Understanding the System	
2. Troubleshooting Procedures	
II. Fundamentals of Hydraulics and Pneumatics - Introduction to Pneumatic Theory	30
A. Advantages of Pneumatics	
B. Pneumatic Applications	
C. Pneumatic Symbols	
D. Pneumatic Components	
E. Basic Pneumatic Systems	
F. Pneumatic Circuits	
G. Pneumatic Air Compressors	
H. Pneumatic Air Receivers	
I. Determining Causes of Failures	
1. Understanding the System	
2. Troubleshooting Procedures	

PROGRAM TITLE: Engineering Technology
COURSE TITLE: Hydraulics and Pneumatics
CIP NUMBER: 1615.061300 AS

LIST PERFORMANCE STANDARDS ADDRESSED:

NUMBER(S): TITLE(S):

12.0 TROUBLESHOOT, AND MAINTAIN PNEUMATIC, HYDRAULIC AND ELECTROMECHANICAL COMPONENTS AND/OR SYSTEMS - The student will be able to:

- 12.01 Identify, classify and describe the function of pneumatic, hydraulic and electrical machines and components.
- 12.02 Construct flow diagrams and of pneumatic, hydraulic, and electromechanical systems.
- 12.03 Perform basic operation maintenance of pneumatic, hydraulic and electromechanical components, devices and/or machines.
- 12.04 Troubleshoot errors, faults, and inconsistencies of pneumatic, hydraulic and electromechanical components, machines and/or systems.
- 12.05 Define special applications of electromechanical, hydraulic and pneumatic machines and devices used process sheet metal, plastics, food and beverages, and other materials.
- 12.06 Describe important limitations of electromechanical, pneumatic and hydraulic machinery.
- 12.07 Operate independent pneumatic, hydraulic and electrical machines properly.
- 12.08 Describe the important operating parameters of pneumatic, hydraulic and electrical machines and/systems.
- 12.09 Identify and use appropriate monitoring gages for pneumatic, hydraulic, and electromechanical machines and/or systems.

13.0 IDENTIFY AND IMPLEMENT LEAN CONCEPTS IN MANUFACTURING ENVIRONMENTS - The student will be able to:

- 13.01 Demonstrate product manufacturing requirements and processing flow.
- 13.02 Demonstrate the role of management in production operations.
- 13.03 Integrate personnel, hardware, and software capabilities for timely completion of products and product orders.
- 13.04 Apply manufacturing resources planning, just-in-time concepts to production and process planning.
- 13.05 Demonstrate good examples of lean manufacturing principles of pull production, perfect first-time quality, waste minimization, continuous improvement, flexibility, and building long lasting relationships with suppliers and customers.
- 13.06 Implement minimization of wastes in the form of waiting time, inventory, processing, motion, over-production, transportation, and scrap.

LIST PERFORMANCE STANDARDS ADDRESSED: (Continued)

NUMBER(S): TITLE(S):

- 13.07 Apply the 5S's: Sort, Set in Order, Shine, Standardize, and Sustain.
- 13.08 Apply six sigma criteria correctly.

15.0 TROUBLESHOOT INDUSTRIAL AUTOMATION SYSTEMS - The student will be able to:

- 15.01 Apply troubleshooting techniques to identify root cause, errors and faults of a problem.
- 15.02 Isolate systems for troubleshooting.
- 15.03 Develop a strategy for making system improvements based on troubleshooting activities.
- 15.04 Identify needed expertise to address the issue.
- 15.05 Participate in troubleshooting and resolution team effectively.



**Florida State College
At Jacksonville**

**Course Learning Outcomes & Assessment
For All College Credit Courses**

NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

Section 1 COURSE PREFIX AND NUMBER: <u>EST1700</u>	SEMESTER CREDIT HOURS: <u>3</u>
COURSE TITLE: <u>Hydraulics and Pneumatics</u>	

Section 2 TYPE OF COURSE: (Click on the box to check all that apply) <table style="width: 100%; margin-top: 10px;"> <tr> <td><input type="checkbox"/> AA Elective</td> <td><input type="checkbox"/> AS Required Professional Course</td> <td><input type="checkbox"/> College Prep</td> </tr> <tr> <td><input type="checkbox"/> AS Professional Elective</td> <td><input checked="" type="checkbox"/> AAS Required Professional Course</td> <td><input type="checkbox"/> Technical Certificate</td> </tr> <tr> <td><input type="checkbox"/> Other _____</td> <td colspan="2"></td> </tr> <tr> <td colspan="3"><input type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)</td> </tr> </table>	<input type="checkbox"/> AA Elective	<input type="checkbox"/> AS Required Professional Course	<input type="checkbox"/> College Prep	<input type="checkbox"/> AS Professional Elective	<input checked="" type="checkbox"/> AAS Required Professional Course	<input type="checkbox"/> Technical Certificate	<input type="checkbox"/> Other _____			<input type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)		
<input type="checkbox"/> AA Elective	<input type="checkbox"/> AS Required Professional Course	<input type="checkbox"/> College Prep										
<input type="checkbox"/> AS Professional Elective	<input checked="" type="checkbox"/> AAS Required Professional Course	<input type="checkbox"/> Technical Certificate										
<input type="checkbox"/> Other _____												
<input type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)												

Section 3 (If applicable) INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES: <table style="width: 100%; margin-top: 10px;"> <tr> <td><input type="checkbox"/> Communications</td> <td><input type="checkbox"/> Social & Behavioral Sciences</td> <td><input type="checkbox"/> Mathematics</td> </tr> <tr> <td><input type="checkbox"/> Natural Sciences</td> <td><input type="checkbox"/> Humanities</td> <td></td> </tr> </table>	<input type="checkbox"/> Communications	<input type="checkbox"/> Social & Behavioral Sciences	<input type="checkbox"/> Mathematics	<input type="checkbox"/> Natural Sciences	<input type="checkbox"/> Humanities	
<input type="checkbox"/> Communications	<input type="checkbox"/> Social & Behavioral Sciences	<input type="checkbox"/> Mathematics				
<input type="checkbox"/> Natural Sciences	<input type="checkbox"/> Humanities					

Section 4 INTELLECTUAL COMPETENCIES: <table style="width: 100%; margin-top: 10px;"> <tr> <td><input checked="" type="checkbox"/> Reading</td> <td><input checked="" type="checkbox"/> Speaking</td> <td><input checked="" type="checkbox"/> Critical Analysis</td> <td><input checked="" type="checkbox"/> Quantitative Skills</td> <td><input type="checkbox"/> Scientific Method of Inquiry</td> </tr> <tr> <td><input checked="" type="checkbox"/> Writing</td> <td><input checked="" type="checkbox"/> Listening</td> <td><input type="checkbox"/> Information Literacy</td> <td><input checked="" type="checkbox"/> Ethical Judgment</td> <td><input checked="" type="checkbox"/> Working Collaboratively</td> </tr> </table>	<input checked="" type="checkbox"/> Reading	<input checked="" type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis	<input checked="" type="checkbox"/> Quantitative Skills	<input type="checkbox"/> Scientific Method of Inquiry	<input checked="" type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input type="checkbox"/> Information Literacy	<input checked="" type="checkbox"/> Ethical Judgment	<input checked="" type="checkbox"/> Working Collaboratively
<input checked="" type="checkbox"/> Reading	<input checked="" type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis	<input checked="" type="checkbox"/> Quantitative Skills	<input type="checkbox"/> Scientific Method of Inquiry						
<input checked="" type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input type="checkbox"/> Information Literacy	<input checked="" type="checkbox"/> Ethical Judgment	<input checked="" type="checkbox"/> Working Collaboratively						

Section 5	
LEARNING OUTCOMES	METHOD OF ASSESSMENT
• Identify common Fundamentals of Hydraulic and Pneumatics.	Hands-on test
• Introduction to Fluid Power Theory.	Hands-on test, quizzes, or written test
• Describe Hydraulic applications.	Hands-on test, quizzes, or written test
• Recognize Hydraulic Components, Symbols and systems.	Hands-on exercises, written quizzes, or tests
• Perform preventive maintenance for a Fluid Power system.	Lab Volt trainer, quizzes, or written test.
• Define the operational laws of Hydraulic and Pneumatic systems.	Hands-on exercises, hands-on tests, written quizzes, or tests
• Perform preventive maintenance for a Pneumatic system.	Lab Volt trainer, quizzes, or written test.
• Instruct the use of Fluid Power schematics.	Lab Volt trainer, quizzes, or written test.
• Differentiate between Hydraulic and Pneumatic systems.	Lab Volt trainer, quizzes, or written test.
• Identify, troubleshoot, and repair common Fluid Power Systems.	Lab Volt trainer, Hands-on exercises, written quizzes, or tests
• Interactively engage in dialogue about current technologies	Hands-on exercises.

Section 6 Name of Person Completing This Form: <u>Darrell J. High</u>	Date: <u>05/06/08</u>
--	-----------------------