

Washtenaw Community College Comprehensive Report

FLP 110 Fluid Power Fundamentals - II Effective Term: Fall 2022

Course Cover

College: Advanced Technologies and Public Service Careers
Division: Advanced Technologies and Public Service Careers
Department: Advanced Manufacturing
Discipline: Fluid Power
Course Number: 110
Org Number: 14410
Full Course Title: Fluid Power Fundamentals - II
Transcript Title: Fluid Power Fundamentals - II
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Inactivation
Change Information:
Other:

Rationale: FLP 101 / 110 / 226 are being combined into one MEC 105 course.

Proposed Start Semester: Fall 2022

Course Description: In this course, students will expand on the foundation developed in FLP 101 with coverage of variable displacement pumps, proper system contamination control and filtration, hydraulic fluid requirements and compatibility, solenoid valves, load control valves, speed controls, fluid power motors and pressure intensifiers. Students will develop skills in a hands-on lab environment with tasks such as building fluid power circuits and the disassembly and inspection of hydraulic components. FLP 110 is generally offered in the second 7 1/2 week session.

Course Credit Hours

Variable hours: No

Credits: 2

Lecture Hours: Instructor: 30 **Student:** 30

Lab: Instructor: 15 **Student:** 15

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 45 **Student:** 45

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

Prerequisite

FLP 101 minimum grade "C"

may enroll concurrently

General Education

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify complex fluid power symbols.

Assessment 1

Assessment Tool: Departmental exam

Assessment Date: Fall 2022

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Departmental exam will be scored using the answer key.

Standard of success to be used for this assessment: 70% of students will score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty will analyze the data.

2. Indicate operation and purpose of intermediate level components in fluid power circuits.

Assessment 1

Assessment Tool: Departmental exam

Assessment Date: Fall 2022

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Departmental exam will be scored using the answer key.

Standard of success to be used for this assessment: 70% of students will score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty will analyze the data.

Course Objectives

1. Identify the International Standards Organization (ISO) and American National Standards Institute (ANSI) schematic symbols of less commonly-used fluid power components.
2. Identify proper application of contamination control devices.
3. Describe principle of operation of meter-in, meter-out and bleed-off flow control valves.
4. Use basic fluid power formulae to calculate actuator force, velocity, area, flow, pressure and prime mover horsepower (HP).
5. Describe the principle of the operation of pressure control valves.
6. Identify commonly used components in fluid power circuits such as reservoirs; filters; meter-in; meter-out and bleed-off control valves; pressure reducing, sequence, unloading, counterbalance valves; intensifiers and accumulators.

New Resources for Course

Course Textbooks/Resources

Textbooks

Eaton Hydraulics. *Industrial Hydraulics Manual*, 5th ed. Eaton Hydraulics, 2001, ISBN: 9780978802202.

IFPS. *Lightning Reference Manual*, 5th ed. International Fluid Power Society, 2001, ISBN: 9789970008001.

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

Other: Document camera

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Allan Coleman</i>	<i>Faculty Preparer</i>	<i>Jan 20, 2022</i>
Department Chair/Area Director: <i>Allan Coleman</i>	<i>Recommend Approval</i>	<i>Jan 20, 2022</i>
Dean: <i>Jimmie Baber</i>	<i>Recommend Approval</i>	<i>Jan 21, 2022</i>
Curriculum Committee Chair: <i>Randy Van Wagnen</i>	<i>Reviewed</i>	<i>Feb 15, 2022</i>
Assessment Committee Chair:		
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Feb 18, 2022</i>

Washtenaw Community College Comprehensive Report

FLP 110 Fluid Power Fundamentals - II Effective Term: Spring/Summer 2020

Course Cover

Division: Advanced Technologies and Public Service Careers
Department: Advanced Manufacturing
Discipline: Fluid Power
Course Number: 110
Org Number: 14410
Full Course Title: Fluid Power Fundamentals - II
Transcript Title: Fluid Power Fundamentals - II
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Three Year Review / Assessment Report
Change Information:

Consultation with all departments affected by this course is required.

Rationale: Three-year update is due.

Proposed Start Semester: Fall 2019

Course Description: In this course, students will expand on the foundation developed in FLP 101 with coverage of variable displacement pumps, proper system contamination control and filtration, hydraulic fluid requirements and compatibility, solenoid valves, load control valves, speed controls, fluid power motors and pressure intensifiers. Students will develop skills in a hands-on lab environment with tasks such as building fluid power circuits and the disassembly and inspection of hydraulic components. FLP 110 is generally offered in the second 7 1/2 week session.

Course Credit Hours

Variable hours: No

Credits: 2

Lecture Hours: Instructor: 30 **Student:** 30

Lab: Instructor: 15 **Student:** 15

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 45 **Student:** 45

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

Prerequisite

FLP 101 minimum grade "C"

may enroll concurrently

General Education

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify complex fluid power symbols.

Assessment 1

Assessment Tool: Departmental exam

Assessment Date: Fall 2022

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Departmental exam will be scored using the answer key.

Standard of success to be used for this assessment: 70% of students will score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty will analyze the data.

2. Indicate operation and purpose of intermediate level components in fluid power circuits.

Assessment 1

Assessment Tool: Departmental exam

Assessment Date: Fall 2022

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Departmental exam will be scored using the answer key.

Standard of success to be used for this assessment: 70% of students will score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty will analyze the data.

Course Objectives

1. Identify the International Standards Organization (ISO) and American National Standards Institute (ANSI) schematic symbols of less commonly-used fluid power components.
2. Identify proper application of contamination control devices.
3. Describe principle of operation of meter-in, meter-out and bleed-off flow control valves.
4. Use basic fluid power formulae to calculate actuator force, velocity, area, flow, pressure and prime mover horsepower (HP).
5. Describe the principle of the operation of pressure control valves.
6. Identify commonly used components in fluid power circuits such as reservoirs; filters; meter-in; meter-out and bleed-off control valves; pressure reducing, sequence, unloading, counterbalance valves; intensifiers and accumulators.

New Resources for Course

Course Textbooks/Resources

Textbooks

Eaton Hydraulics. *Industrial Hydraulics Manual*, 5th ed. Eaton Hydraulics, 2001, ISBN: 9780978802202.

IFPS. *Lightning Reference Manual*, 5th ed. International Fluid Power Society, 2001, ISBN: 9789970008001.

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

Other: Document camera

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Jim Popovich</i>	<i>Faculty Preparer</i>	<i>Aug 12, 2019</i>
Department Chair/Area Director: <i>Thomas Penird</i>	<i>Recommend Approval</i>	<i>Aug 14, 2019</i>
Dean: <i>Brandon Tucker</i>	<i>Recommend Approval</i>	<i>Aug 22, 2019</i>
Curriculum Committee Chair: <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Sep 19, 2019</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Oct 10, 2019</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Oct 14, 2019</i>

Course Discipline Code & No: FLP 110 Title: Fluid Power Fundamentals - II Effective Term WI 2010
 Division Code: HAT Department Code: INTD Org #:
 Don't publish: College Catalog Time Schedule Web Page

Reason for Submission. Check all that apply.
 New course approval Reactivation of inactive course
 Three-year syllabus review/ Assessment report Inactivation (Submit this page only.)
 Course change

Change information: Note all changes that are being made. Form applies only to changes noted.
 Consultation with all departments affected by this course is required. Total Contact Hours (total contact hours were: 90)
 Course discipline code & number (was FLP 111)* Distribution of contact hours (contact hours were:
 *Must submit inactivation form for previous course. lecture: _____ lab _____ clinical _____ other _____)
 Course title (was Fluid Power Fundamentals) Pre-requisite, co-requisite, or enrollment restrictions
 Course description Change in Grading Method
 Course objectives (minor changes) Outcomes/ Assessment
 Credit hours (credits were: 4) Objectives/Evaluation
 Other _____

Rationale for course or course change. Attach course assessment report for existing courses that are being changed.
 The content taught in FLP 111 has been split into two separate courses FLP 101 and FLP 110 to allow students to receive introductory (101) training to all areas (robotics, fluid power and numerical control) and then focus on their area of concentration.

Approvals Department and divisional signatures indicate that all departments affected by the course have been consulted.

Department Review by Chairperson New resources needed All relevant departments consulted
 Print: Jim Popovich Signature: [Signature] Date: 12/1/09
 Faculty/Preparer
 Dept. Chair Recommendation Yes No
 Print: GARY L. SCHULTZ Signature: [Signature] Date: 12/1/09
 Department Chair
 Division Review by Dean
 Request for conditional approval
 Recommendation Yes No [Signature] Date: 12/21/09
 Dean's/ Administrator's Signature
 Curriculum Committee Review
 Recommendation Tabled Yes No [Signature] Date: 3/11/10
 Curriculum Committee Chair's Signature
 Vice President for Instruction Approval
[Signature] Date: 3-12-10
 Vice President's Signature
 Approval Yes No Conditional

Do not write in shaded area.
 Log File 2/21/09 Copy Banner _____ C&A Database _____ C&A Log File _____ Basic skills Contact fee

Please return completed form to the Office of Curriculum & Assessment and email an electronic copy to sjohn@wccnet.edu for posting on the website.

*Complete ALL sections which apply to the course, even if changes are not being made.

Course: FLP 110	Course title: Fluid Power Fundamentals - II
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Credit hours: <u> 2 </u> If variable credit, give range: _____ to _____ credits	Contact hours per semester: <table style="width:100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center; border-bottom: 1px solid black;">Student</td> <td style="text-align: center; border-bottom: 1px solid black;">Instructor</td> </tr> <tr> <td>Lecture:</td> <td style="text-align: center;">30</td> <td style="text-align: center;">30</td> </tr> <tr> <td>Lab:</td> <td style="text-align: center;">15</td> <td style="text-align: center;">15</td> </tr> <tr> <td>Clinical:</td> <td style="text-align: center;">—</td> <td style="text-align: center;">—</td> </tr> <tr> <td>Practicum:</td> <td style="text-align: center;">—</td> <td style="text-align: center;">—</td> </tr> <tr> <td>Other:</td> <td style="text-align: center;">—</td> <td style="text-align: center;">—</td> </tr> <tr> <td>Totals:</td> <td style="text-align: center;">45</td> <td style="text-align: center;">45</td> </tr> </table>		Student	Instructor	Lecture:	30	30	Lab:	15	15	Clinical:	—	—	Practicum:	—	—	Other:	—	—	Totals:	45	45	Are lectures, labs, or clinicals offered as separate sections? <input type="checkbox"/> Yes - lectures, labs, or clinicals are offered in separate sections <input checked="" type="checkbox"/> No - lectures, labs, or clinicals are offered in the same section	Grading options: <input type="checkbox"/> P/NP (limited to clinical & practica) <input type="checkbox"/> S/U (for courses numbered below 100) <input checked="" type="checkbox"/> Letter grades
	Student	Instructor																						
Lecture:	30	30																						
Lab:	15	15																						
Clinical:	—	—																						
Practicum:	—	—																						
Other:	—	—																						
Totals:	45	45																						

Prerequisites. Select one:

College-level Reading & Writing
 Reduced Reading/Writing Scores (Add information at Level I prerequisite)
 No Basic Skills Prerequisite (College-level Reading and Writing is not required.)

In addition to Basic Skills in Reading/Writing:

Level I (enforced in Banner)

Course	Grade	Test	Min. Score	Concurrent Enrollment <small>Can be taken together</small>	Corequisites <small>Must be enrolled in this class also during the same semester</small>
<u> FLP 101 </u>	<u> C </u>	_____	_____	<input checked="" type="checkbox"/>	_____
<input type="checkbox"/> and <input type="checkbox"/> or _____	_____	_____	_____	<input type="checkbox"/>	_____
<input type="checkbox"/> and <input type="checkbox"/> or _____	_____	_____	_____	<input type="checkbox"/>	_____
<input type="checkbox"/> and <input type="checkbox"/> or _____	_____	_____	_____	<input type="checkbox"/>	_____

Level II (enforced by instructor on first day of class)

Course	Grade	Test	Min. Score
_____	_____	_____	_____
<input type="checkbox"/> and <input type="checkbox"/> or _____	_____	_____	_____
<input type="checkbox"/> and <input type="checkbox"/> or _____	_____	_____	_____

Enrollment restrictions (In addition to prerequisites, if applicable.)

and or Consent required
 and or Admission to program required
 and or Other (please specify): _____
 Program: _____

Please send syllabus for transfer evaluation to:
 Conditionally approved courses are not sent for evaluation.
 Insert course number and title you wish the course to transfer as.

<input type="checkbox"/> E.M.U. as _____	<input type="checkbox"/> _____ as _____
<input type="checkbox"/> U of M as _____	<input type="checkbox"/> _____ as _____
<input type="checkbox"/> _____ as _____	<input type="checkbox"/> _____ as _____

MASTER SYLLABUS

<p>Course: FLP 110</p>	<p>Course title: Fluid Power Fundamentals - II</p>	
<p>Course description State the purpose and content of the course. Please limit to <u>500</u> characters.</p>	<p>This class builds on the foundation set in FLP 101 with coverage of variable displacement pumps, proper system contamination control and filtration, hydraulic fluid requirements and compatibility, solenoid valves, load control valves, speed controls, fluid power motors and pressure intensifiers. Hands-on exercises include building of fluid power circuits and disassembly/inspection of hydraulic components. This course contains material previously taught in FLP 111. FLP 110 is generally offered in the second 7½ week session.</p>	
<p>Course outcomes List skills and knowledge students will have after taking the course. Assessment method Indicate how student achievement in each outcome will be assessed to determine student achievement for purposes of course improvement.</p>	<p>Outcomes (applicable in all sections)</p> <p>Identify additional and more complex fluid power symbols.</p> <p>Indicate operation and purpose of intermediate level components in fluid power circuits.</p>	<p>Assessment Methods for determining course effectiveness</p> <p>Departmental exam</p> <p>Departmental exam</p>
<p>Course Objectives Indicate the objectives that support the course outcomes given above.</p> <p>Course Evaluations Indicate how instructors will determine the degree to which each objective is met for each student.</p>	<p>Objectives (applicable in all sections)</p> <p>Identify the ISO or ANSI schematic symbols of less commonly-used fluid power components.</p> <p>Identify proper application of contamination control devices.</p> <p>Describe principle of operation of meter-in, meter-out and bleed-off flow control valves.</p> <p>Use basic fluid power formulae to calculate actuator force, velocity, area, flow, pressure and prime mover H.P.</p> <p>Describe the principle of the operation of pressure control valves.</p> <p>Identify commonly used components in fluid power circuits.</p> <ul style="list-style-type: none"> • Reservoirs • Filters • Meter-in, meter-out and bleed-off control valves • Pressure reducing, sequence, unloading, counterbalance valves. • Intensifiers and accumulators 	<p>Evaluation Methods for determining level of student performance of objectives</p> <p>Exams, quizzes and completion of lab exercises</p>

List all new resources needed for course, including library materials.

Student Materials:

List examples of types	Industrial Hydraulics Manual by Easton Hydraulics	Estimated costs
Texts	Fluid Power Designers' Lighting Reference Manual – 8 th + ed.	\$ 90.00
Supplemental reading	3-ring binder	\$ 22.00
Supplies	Calculator	\$ 20.00
Uniforms	Safety Glasses	
Equipment		
Tools		
Software		

MASTER SYLLABUS

Equipment/Facilities: Check all that apply. (All classrooms have overhead projectors and permanent screens.)

Check level <u>only</u> if the specified equipment is needed for <u>all</u> sections of a course. <input type="checkbox"/> Level I classroom Permanent screen & overhead projector <input type="checkbox"/> Level II classroom Level I equipment plus TV/VCR <input checked="" type="checkbox"/> Level III classroom Level II equipment plus data projector, computer, faculty workstation	<input type="checkbox"/> Off-Campus Sites <input type="checkbox"/> Testing Center <input type="checkbox"/> Computer workstations/lab <input type="checkbox"/> ITV <input type="checkbox"/> TV/VCR <input type="checkbox"/> Data projector/computer <input type="checkbox"/> Other _____
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Assessment plan:

Learning outcomes to be assessed (list from Page 3)	Assessment tool	When assessment will take place (semester & year)	Course section(s)/other population	Number students to be assessed
Identify additional and more complex fluid power symbols.	Departmental exam	Fall 2010 and every three years thereafter	All sections	All students
Indicate operation and purpose of intermediate level components in fluid power circuits.	Departmental exam	Fall 2010 and every three years thereafter	All sections	All students

Scoring and analysis of assessment:

- Indicate how the above assessment(s) will be scored and evaluated (e.g. departmentally developed rubric, external evaluation, other). Attach the rubric/scoring guide.

Departmental exam will be scored using the answer key.

- Indicate the standard of success to be used for this assessment.

The overall class average on all questions identified for assessment will be 70% or higher.

- Indicate who will score and analyze the data (data must be blind-scored).

Departmental faculty will blind-score and analyze the data.

- Explain the process for using assessment data to improve the course.

Assessment results will be discussed by faculty teaching the class and presented at a department meeting. Areas of weakness and their solutions will be identified. Necessary course changes will be implemented.