MASTER SYLLABUS

Course Discipline Code & No: FLP-111 **Title:** Fluid Power Fundamentals **Effective Term** ~~W~~ Fall 2006

Division Code: HAT **Department Code:** ~~IND~~ FLT **Org #:** 14400

Don't publish: ☐ College Catalog ☐ Time Schedule ☐ Web Page

Reason for Submission. Check all that apply.

- ☐ New course approval
- ☒ Three-year syllabus review/Assessment report
- ☐ Course change
- ☐ Reactivation of inactive course
- ☐ Inactivation (Submit this page only.)

Change information:

Minor changes (corrections, editing, clarification)

- ☐ Course discipline code & number (was _____)*
  *Must submit inactivation form for previous course.
- ☐ Course title (was _____)
- ☒ Course description
- ☐ Course objectives (minor changes)

For major changes, consultation with all departments affected by this course is required.

Major changes (reviewed by Curriculum Committee.)

- ☐ Credit hours (credits were: _____)
- ☐ Total Contact Hours (total contact hours were: _____)
- ☐ Distribution of contact hours (contact hours were: lecture: _____ lab _____ clinical _____ other _____)
- ☒ Pre-requisite, co-requisite, or enrollment restrictions
- ☐ General Education Distribution Course: Add ☐ Remove ☐
- ☐ Honors section approval
- ☐ Change in Grading Method
- ☐ Objectives
- ☐ Other _____

Rationale for course or course change. Attach course assessment report.

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 (Faculty/Preparer) Signature: Jim Popovich Date: 11/22/05

Print: Gary Schultz (Department Chair) Signature: Gary L Schultz Date: 11/23/05

Division Review by Dean ☐ Request for conditional approval

Recommendation ☒ Yes ☐ No

Dean's/Administrator's Signature: [signature] Date: 11/23/05

Curriculum Committee Review

Recommendation _____

☐ Tabled ☑ Yes ☐ No

Curriculum Committee Chair's Signature: [signature] Date: 2/6/06

Vice President of Instruction Approval

Approval ☒ Yes ☐ No

Vice President's Signature: Roger M. Palay. Date: 2/13/06

Do not write in shaded area.

Entered in: Banner 3/6 **C&A Database** 3/6 **Log File** 11/23/05 3/6 **Basic skills spreadsheet updated** ☑ **Contact fee** ☐

Please return completed form to the Office of Curriculum & Assessment. Rec'd 11/23/05

MASTER SYLLABUS

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

Credit hours:
4

If variable credit, give range:
__ to __credits

Instructor contact hours per semester:
Lecture: 30
Lab: 60
Clinical: _____
Practicum: _____
Other: _____ _____
Total contact hours: 90

Are lectures, labs, or clinicals offered as separate sections?
☐ Yes - lectures, labs, or clinicals are offered in separate sections
☒ No - lectures, labs, or clinicals are offered in the same section

Grading options:
☐ P/NP (limited to clinical & practica)
☐ S/U (for courses numbered below 100)
☒ Letter grades

Prerequisites. Select one:

☒ College-level Reading & Writing

☐ Reduced Reading/Writing Scores
COMPASS Reading _____
COMPASS Writing _____

☒ No Basic Skills Prerequisite
(College-level Reading and Writing is not required.)

12/0/05

In addition to Basic Skills in Reading/Writing:

Level I (enforced in Banner)

	Course/Test	Grade/Score	Concurrent Enrollment
			☐
☐ and ☐ or			☐
☐ and ☐ or			☐

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

	Course	Grade/Score
☐ and ☐ or		
☐ and ☐ or		
☐ and ☐ or		

Corequisites (must be enrolled in this class also during the same semester):
_____
_____

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

☐ and ☐ or ☐ Instructor consent required
☐ and ☐ or ☐ Admission to program required
Program _____
☐ and ☐ or ☐ Other (please specify):
_____

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

Add to General Education distribution
(Select one area)
☐ Writing ☐ Nat. Sci.
☐ Speech ☐ Soc./Behav/ Sci.
☐ Math ☐ Arts/Hum.

Courses must meet all criteria.
☐ 1. Is a standard introductory course in the discipline
☐ 2. Has a verified transfer acceptance
☐ 3. Meets the critical thinking requirement
☐ 4. Assesses academic achievement
☐ 5. Covers minimum knowledge/skills

Honors section. Not all criteria are required. Check relevant items.

☐ 1. Emphasis on primary source materials
☐ 2. Emphasis on independent study/research
☐ 3. Greater rigor of course materials
☐ 4. Interdisciplinary approach
☐ 5. Development of critical thinking skills
☐ 6. Additional course objectives
☐ 7. Additional instructional methods
☐ 8. Satisfaction of the service component

Course discipline code & number	Course title	Credit hours
FLP-111	Fluid Power Fundamentals	4

Course description Brief statement of the purpose and content of the course. (Please limit to 500 characters.)	This an introductory course in fluid power that deals with the basic principles of hydraulic and pneumatic components and circuits. Topics covered include fluid power safety and operating principles, pumps and compressors, fluids, contamination control, directional control valves, pressure controls, flow controls, actuators and accumulators. Lab exercises include component disassembly/ inspection/ reassembly and building circuits on the hydraulic trainers.

Course outcomes List brief statements that indicate what students will know and be able to accomplish as a result of taking the course. These outcomes will be common across all sections, instructors, settings, and terms. Indicate how these outcomes will be assessed to determine student achievement for purposes of course improvement.	**Common outcomes expected in all sections of the course (usually 2-5)**	**Assessment Method**
	Identify fluid power symbols.	Pre and Post Test - Matching
	Indicate operation and purpose of components in fluid power circuits.	Departmental Exam - multiple choice, T/F, short answer
	Identify description of operation of commonly used fluid power components in a beginner-level circuit diagram	Departmental Exam - multiple choice, T/F, short answer
	Construct a hydraulic circuit on fluid power trainer from a circuit diagram.	Hands-on Exercise (see attached rubric)

Indicate the major instructional objectives that support the course outcomes given above. These objectives will be common across all sections, instructors, and terms. Indicate how instructors will know the degree to which each objective is met for each student.	**Common Instructional Objectives expected in all sections of the course (usually 2-4 per outcome)**	**Method of evaluating student performance of objectives**
	Describe two major differences between Hydraulic and Pneumatic circuits.	Department Exams and Quizzes
	Apply Pascal's Law as it applies to fluid power.	Department Exams and Quizzes
	Identify ISO and ANSI symbols of commonly used fluid power components.	Department Exams and Quizzes
	Use basic fluid power formulae to calculate actuator force, velocity, area, flow, pressure and H.P.	Department Exams and Quizzes
	Describe operation of gear, vane and piston pumps.	Department Exams and Quizzes
	Convert commonly used pressure units - PSIG, PSIA, In. Hg. vaccum., bar.	Department Exams and Quizzes
	Identify purpose of commonly used components in fluid power circuits: reservoir/receiver, pump/compressor, relief valve/regulator, directional valves, flow controls, cylinders and motors, sequence valve, reducing valves, cournterbalance valves, intensifiers, accumulators.	Department Exams and Quizzes
	Given pump GPM, determing proper fluid conductor sizing.	Department Exams and Quizzes
	Construct a hydraulic circuit from schematic diagram.	Lab Exercise

List all new resources needed for course, including library materials.
Fluid Power Trainers in TI Lab

Student Materials:

List examples of types		**Estimated costs.**
Texts Supplemental reading Supplies Uniforms Equipment Tools Software	Industrial Hydraulcis Manual Fluid Power Designers Lightning Reference Handbook Safety Glasses	$ 95

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

Check level only if the specified equipment is needed for all sections of a course.

☐ Level I classroom
Permanent screen & overhead projector

☐ Level II classroom
Level I equipment plus TV/VCR

☒ Level III classroom
Level II equipment plus data projector, computer, faculty workstation

☐ Off-Campus Sites
☐ Testing Center
☒ Computer workstations/lab
☐ ITV
☐ TV/VCR
☐ Data projector/computer
☒ Other TI Fluid Power Laboratory Training equipment and Automation Studio stations in TI-139

Assessment plan:

Learning outcomes to be assessed	**Assessment tool**	**When assessment will take place**	**Course section(s)/other population**	**Number students to be assessed**
See Attached				

Scoring and analysis plan:

1. Indicate how the above assessment(s) will be scored and evaluated (e.g. departmentally developed rubric, external evaluation, other). Describe the scoring range to be used, or include a copy of the rubric.

   See attached rubric.

2. Indicate the standard of success to be used for this assessment (e.g. 75% of students must meet all learning outcomes).

   75% of students will score 3 or better on rubric(s).

3. Indicate who will score and analyze the data.

Data analysis and scoring will be done by instructor(s) teaching each section.

4. Explain how and when the assessment results will be shared with the department and other involved faculty.

   Within 1 month of course completion, tabulation and assesment results will be given to department chair and others in the department involved in teaching the same course.

5. Describe any additional assistance the department will require to complete this assessment.

Please return completed form to the Office of Curriculum & Assessment, SC 247.

Learning Outcomes to be assessed	Assessment Tool	When Assessment Will Take Place	Course sections	Number of Students To Be Assessed
Identify Fluid Power Symbols	Pre and Post Test Matching	Pre and Post Course	All Sections	All Completers
Identify purpose of commonly used fluid power components in a beginner-level circuit diagram	Instructor-made test	Completion of Course	All Sections	All Completers
Identify description of operation of commonly used fluid power components in a beginner-level circuit diagram	Instructor-made test	Completion of Course	All Sections	All Completers
Construct a circuit on a fluid power trainer from a circuit diagram. Circuit will include 1 pump, 1 directional valve 3 pressure controls, 2 actuators and 1 flow control valve	Hands-on Fluid Power Trainer Exercise	Completion of Course	All Sections	All Completers

Learning Outcomes to be assessed	5	4	3	2	1	0
Identify Fluid Power Symbols (Matching)	23-25 out of 25 successfully identified	20-22 out of 25 successfully identified	15-19 out of 25 successfully identified	10-14 out of 25 successfully identified	5-9 out of 25 successfully identified	Less than 5 successfully identified
Identify purpose of commonly used fluid power components in a beginner-level circuit diagram	successfully identified >= 90%	successfully identified 80 - 89%	successfully identified 70% - 79%	successfully identified 60% - 69%	successfully identified 50 - 59%	successfully identified < 50%
Identify description of operation of commonly used fluid power components in a beginner-level circuit diagram	successfully identified >= 90 %	successfully identified 80 - 89%	successfully identified 70 - 79%	successfully identified 60-69%	successfully identified 50-59%	successfully identified <50%
Construct a circuit on a fluid power trainer from a circuit diagram. Circuit will include 1 pump, 1 directional valve, 3 pressure controls, 2 actuators and 1 flow control valve	Circuit functions correctly with no assistance	Circuit connections correct, but won't cycle. No assistance. Circuit functions after 1 "Help"	Majority (> 50%) of connections correct, circuit not functional	> 40 % of connections correct, circuit not functional	>30 % of connections correct, circuit not functional	<30 % of connections correct. Circuit not functional