

SYLLABUS

Date/Revision 23 March 2017 / Rev.1

Faculty Engineering

Approval Dean of Engineering Faculty

SUBJECT: PNEUMATICS AND HYDRAULICS 1

1. Identification of Subject:

Name of Subject : Pneumatics and Hydraulics 1

Code of Subject : PNEU-3101

SKS : 2 Semester : 5 Study Program : MTE

Lecturer : To be announced

2. Competency

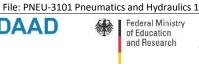
After having the course, students are expected able to:

- a) Identify pump types and regulator components.
- Identify, select and maintain compressors.
- c) Identify and install proper piping and connectors.
- d) Utilize schematics to construct pneumatic circuits.
- e) Maintain a pneumatic system.
- diagnose Fault and apply maintenance procedure of pneumatic and electro pneumatic component and system such as:
 - pneumatic controls and electro pneumatics control;
 - Linear circuits;
 - Regenerative circuits;
 - Sequencing circuits:
 - Counterbalance circuits;
 - The traverse and feed circuit;
 - Rotary motion circuit.
 - Maintain filtration systems.
- design and analyse of pneumatic and electro pneumatic circuit application

3. Description of Subject:

The Pneumatics and Hydraulics course is delivered in semester 5 and semester 6. In the fifth semester course the students will learn the fundamentals of industrial fluid power which include vacuum, Pneumatics. The course will emphasize basic theory, components sizing, construction and function, how to read fluid power circuit diagrams using the correct symbols and troubleshooting techniques. The controls of pneumatics system controlled by pneumatics and controlled by electrical (electropneumatics) are introduced. During the semester the students will have the opportunity to get practical workshop in PT. FESTO Indonesia located in Technopark-BSD City to exercise pneumatics and electropneumatics-systems.









4. Learning Approach

: Combination of Expository - inquiry and colaborative Approach Method : Discussion, question answer, sample problem, group work

Student Task : Home work, presentation

Media : LCD projector, film.

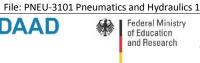
5. Evaluation

a) Absence maximum : 25% b) Participation in discussion : 5 points c) Homework, Classwork : 5 points d) Presentation, Simulation : 10 points e) Daily Quiz : 20 points f) Final Examination : 60 points

> Total : 100 points

6. Contents/Topics of Lecturing:

Week	Content/ Topics of Lecturing	Text Book	Remark
- Treek	Content, replies of Lestering	Chapter	Kemark
1-2	Fundamental of pneumatic:	Ch1	
	History of Pneumatic		
	Physical law of pneumatic		
	Gas law and various process		
	Development of pneumatic		
	Characteristic and application of pneumatic		
	Structure and signal flow of pneumatic system , symbol and standard		
	of component		
3-4	Air Generation and distribution:	Ch2	Quiz-1
	Air quality: Humidity , cleans , pressure , standard air temperature		
	System for air generation: Compressor , Dryer , Filter , Lubricator		
	Distribution system: Piping system		
	SAC, DAC, RC, motor and pneumatic indicator , construction and		
	characteristic of cylinder		
5-6	Pneumatic components:	Ch3	Quiz-2
	Actuator and output Device		
	 Valve and control Valve: Directional control valve, pressure control valve, solenoid valve. 		
	Sensor: Type and characteristic of sensor , application in electro pneumatic		
7	Design Procedure of Pneumatic:	Ch4	
	Method of development		
	Control in Pneumatic Systems: Single acting, Double acting and multi		
	cylinder actuation, Pneumatic and electro pneumatic simple circuit,		







	Control system in pneumatic, Position control, Speed control, time delay				
8	MIDSEMESTER BREAK				
9	Software using in pneumatic design: Pneumatic circuit and electro pneumatic circuit development using software				
10-13	Example and application of pneumatic and Electro pneumatic	Ch5	Quiz-3		
	System:				
	One Cylinder Control				
	Parallel motion Control				
	Two actuator control				
	Reversing Valve control				
	Logic control system.				
	Allocating device, sorting device , edge folding device, Foil welding				
	drum, switching point device				
	Feed rail separator, Welding machine for thermoplastic, Quarry				
	stone sorter				
	Compactor for domestic rubbish, clamping camera housing				
	• Input station for laser cuter, partial automation of an internal grinder,				
	Drilling machine				
	Pneumatic counter				
14-15	Fault Diagnoses, Trouble-shooting and maintenance of	Ch6	Quiz-4		
	Pneumatic system :				
	Documentation of Pneumatic Systems: Function diagram, Circuit				
	diagram, operating instruction, data sheets				
	Effect of malfunction: Quality of air , wear and tear , blocking ,				
	leakages, seizure, breakages, pressure drop				
	Fault Diagnosis: External and internal failure				
	Fault Finding: Fault elimination by operating and maintenance Approximation of the provided of the pr				
	operator, Through costumer serviceMaintenance: Preventive and corrective maintenance				
	Iviaintenance: Preventive and corrective maintenance		-		
16	Final Examination				

7. Book Reference:

Text Book:

- "Pneumatic Basic Level", Authors: Peter Croseer & Frank Ebel, Publisher: FESTO-AG Germany.
- "Electro pneumatic Basic Level", **Author**: G Prede & D. Schloz, **Publisher**: FESTO–AG Germany.
- "99 Example of pneumatic application", Author: G Prede & D. Schloz Publisher: FESTO-AG Germany.

[Subject to change / MaS/Rev.01]





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