

## Modul Description

<b>Module name</b>	Course Module
<b>Module level, if applicable</b>	Bachelor of Electronics Engineering
<b>Code, if applicable</b>	5215-081-3
<b>Subtitle, if applicable</b>	-
<b>Course, if applicable</b>	Pneumatic Control Techniques
<b>Semester(s) in which the module istaught</b>	VI
<b>Person responsible for the module</b>	Lecturer of Courses
<b>Lecturer</b>	Drs. Pitoyo Yuliatmojo, M.T
<b>Language</b>	Indonesian Language [Bahasa Indonesia]
<b>Relation to Curriculum</b>	This course is a mandatory course for Control Electronics Specialization and offered in the 6 <sup>th</sup> semester.
<b>Type of teaching, contact hours</b>	<p>Teaching methods used in this course are:</p> <ul style="list-style-type: none"> <li>- Lecture (i.e., group investigation, small group discussion, case study, and video-based learning)</li> <li>- Structured assignments (i.e., essays and case study)</li> <li>- Practice (i.e., computer simulation and case study in laboratorium)</li> </ul> <p>The class size for lecture is 30 students. Contact hours for lecture is 27 hours, assignments are 32 hours</p>
<b>Workload</b>	<p>For this course, students required to meet a minimum of 91 hours in one semester, which consist of:</p> <ul style="list-style-type: none"> <li>- 27 hours for lecture,</li> <li>- 32 hours for structured assignments,</li> <li>- 32 hours for private study,</li> </ul>
<b>Credit points</b>	2 credit points (equivalent with 2.88 ECTS)
<b>Requirements according to the examination regulations</b>	Students must have attended all classes and submitted all class assignments that are scheduled before the final tests.
<b>Recommended prerequisites</b>	Students must have attended all classes and submitted all class assignments that are scheduled before the final tests.

<p><b>PLO-ILO-CLO</b></p>	<p>After completing the course and given with this case:</p> <p><b>Course Learning Objectives (CLO1):</b> Mahasiswa mampu memahami penggunaan dan fungsi komponen Pneumatik dan Hidrolik pada proses produksi industri (K1) (30)</p> <p><b>Course Learning Objectives (CLO2):</b> Mahasiswa mampu merancang prototype sebuah mesin sederhana dengan sistem pneumatik. (K2, S1, S3, C1) (70)</p> <p><b>Program Learning Outcome (PLO3):</b> Menerapkan kompetensi teknik elektronika untuk memecahkan masalah keteknikan</p> <p><b>Knowledge (K1):</b> Menerapkan matematika, ilmu dasar dan teknik dasar untuk merancang dan menganalisis untuk memecahkan masalah di bidang teknik elektronika.</p> <p><b>Knowledge (K2):</b> Untuk menerapkan prinsip-prinsip teknik elektronik untuk memecahkan masalah dalam sistem teknik elektronik</p> <p><b>Engineering and Education Skill (S1):</b> Mampu merancang prinsip dan aplikasi sistem rekayasa elektronik</p> <p><b>Engineering and Education Skill (S2):</b> Mampu menganalisis prinsip kerja dan penerapan sistem rekayasa elektronik</p> <p><b>Engineering and Education Skill (S3):</b> Mampu mencari alternatif solusi dan pemecahan masalah di bidang teknik elektronika.</p> <p><b>Competence (C1):</b> Menerapkan teknologi baru di bidang rekayasa dengan mempertimbangkan standar teknis, aspek kinerja, keandalan, penerapan, dan keberlanjutan</p>
<p><b>Content</b></p>	<p><b>Students will learn about:</b> Mata kuliah ini membahas tentang penggunaan dan fungsi komponen Pneumatik dan Hidrolik pada proses produksi industri, simbol-simbol pneumatik dan diagram rangkaian pneumatik, kontrol stroke dependent secara langsung dan tak langsung. throttle relief valve dan two hand safety block, tekanan udara kompresor, komponen-komponen pneumatik, komponen-komponen elektro pneumatik, karakteristik pompa, katup aliran dan tekanan, katup kontrol arah (directional control valve), restrictor, orifice, pengukuran waktu dan tekanan silinder, metode perhitungan gaya, kecepatan dan keluaran. Kontrol elektro-hidrolik: diagram rangkaian hidrolik, diagram rangkaian listrik, diagram fungsi, konstruksi</p>

	sistem elektro hidrolik, aktuasi silinder tunggal dan silinder ganda, katup solenoid (kontrol langsung dan tidak langsung. Praktikum mencakup penggunaan komponen-komponen pneumatik, elektro pneumatik dan hidrolik pada proses produksi industri
<b>Forms of Assessment</b>	Assessment is carried out based on written examinations, assessment/evaluation of the learning process and performance with the following components: Presence and Activity: 5%; Structured tasks: 70%; Mid Test: 5%; Final Test: 20%
<b>Study and examination requirements and forms of examination</b>	<p><b>Study and examination requirements:</b></p> <ul style="list-style-type: none"> <li>- Students must attend 15 minutes before the class starts.</li> <li>- Students must switch off all electronic devices.</li> <li>- Students must inform the lecturer if they will not attend the class due to sickness, etc.</li> <li>- Students must submit all class assignments before the deadline.</li> <li>- Students must attend the exam to get final grade.</li> </ul> <p><b>Form of examination:</b> Written exam: Essay</p>
<b>Media employed</b>	Direct Whiteboard and Power Point Presentation.
<b>Reading list</b>	<ol style="list-style-type: none"> <li>1. P.Hasebrink, R.Kobler, Fundamentals Of Pneumatik Kontrol Engineering -Textbook, Esslingen, Festo Didactic, 1989</li> <li>2. P. Croser, Pneumatiks, Basic Level Textbook, Esslingen ,Festo Didactic,1989</li> <li>3. P.Croser, Pneumatik, Tingkat Dasar, Jakarta, Festo Didactic, PT Nusantara Cybernetic Eka Perdana, 1994</li> <li>4. Werner Deppert, Kurt Stoll, Pneumatik Kontrol, Wurzburg, Vogel-Verlag,1987.</li> </ol>