

### Module Description

<b>Module name</b>	Physical Electronics 1
<b>Module level, if applicable</b>	Bachelor of Science
<b>Code, if applicable</b>	23H02120102
<b>Subtitle, if applicable</b>	-
<b>Course, if applicable</b>	-
<b>Semester(s) in which the module is taught</b>	3 <sup>rd</sup>
<b>Person responsible for the module</b>	Prof. Dr. Arifin, M.T.
<b>Lecturer</b>	<ol style="list-style-type: none"> <li>1. Prof. Dr. Arifin, M.T.</li> <li>2. Dr. Ir. Bidayatul Armynah, M.T.</li> </ol>
<b>Language</b>	Indonesian Language [Bahasa Indonesia]
<b>Relation to Curriculum</b>	Undergraduate degree program, mandatory, 3 <sup>rd</sup> semester
<b>Type of teaching, contact hours</b>	<p>Teaching methods: [Focus group discussion], [Self-directed learning] [<del>simulation</del>], [<del>case study</del>], [<del>collaborative learning</del>], [<del>project-based learning</del>], [<del>problem-based learning</del>].</p> <p>Teaching forms: [lecture], [<del>tutorial</del>], [seminar], [<del>practicum</del>], [<del>research</del>], [<del>internship</del>], [<del>community service</del>]</p> <p>CH: 08.00 - 16.00</p>
<b>Workload</b>	<p>For this course, students are required to meet a minimum of 90.66 hours in one semester, which consist of:</p> <ul style="list-style-type: none"> <li>- 26.67 hours for lecture,</li> <li>- 32.00 hours for structured assignments,</li> <li>- 32.00 hours for private study.</li> </ul>
<b>Credit points</b>	2 credit points (equivalent with 3.4 ECTS)

<b>Requirements according to the examination regulations</b>	Students have participated in at least 80% of the learning activities (Academic Regulations, Chapter VII)
<b>Recommended prerequisites</b>	Basic Physics 2
<b>Module objectives/intended learning outcomes</b>	<p>After completing the course, Students are able:</p> <p><b>Intended Learning Outcomes (ILO):</b></p> <p><b>ILO 1:</b> Students will have relatively deep understood in classical and basic quantum physics. [ILO 1] – Kn</p> <p><b>ILO 2:</b> Students will be able to use the fundamental principles of physics in modeling and computation to solve the complex physical problem. [ILO 2] – Kn</p> <p><b>Course Learning Objective (CLO):</b></p> <ol style="list-style-type: none"> <li>1. Mastery of the concepts of electrical physics concerning direct current, alternating current, and electrical power in circuits.</li> <li>2. Mastery of the recognition of characteristics and properties of electronic components and the use of electrical measuring instruments in electrical circuits.</li> <li>3. Analysis of electrical circuits composed of various electrical components, analysis of transistor amplifiers with grounded base, emitter, and collector, as well as analysis of junction field-effect transistors (JFET) and metal-oxide-semiconductor field-effect transistors (MOSFET), as well as thyristors and transducers.</li> </ol> <p><b>Sub CLO:</b></p> <p>ILO 1 ⇒ CLO-1: Able to explain the basic concepts of physics about electricity.</p> <p>ILO 2 ⇒ CLO-2: Able to recognize and use electrical components and measuring instruments.</p> <p>ILO 2 ⇒ CLO-3: Able to analyze direct current and alternating current electrical circuits.</p> <p>ILO 2 ⇒ CLO-3: Able to analyze the properties and characteristics of semiconductors and diodes &amp; power supply circuits.</p> <p>ILO 2 ⇒ CLO-3: Able to analyze the properties and characteristics of power supply circuits.</p>

	<p>ILO 2 <math>\Rightarrow</math> CLO-3: Able to analyze the dipole transistor amplifier with grounded base, collector and emitter and apply the use of the concept in electrical circuits based on their characteristics and benefits.</p> <p>ILO 2 <math>\Rightarrow</math> CLO-3: Be able to analyze JFET and MOSFET field effect transistor amplifiers as well as thyristors and transducers.</p>
<b>Content</b>	<p>Students will learn about:</p> <ol style="list-style-type: none"> <li>1. Basic Concepts of Electrical Physics</li> <li>2. Electrical Components &amp; Measurement Instruments</li> <li>3. Direct Current &amp; Alternating Current Circuits</li> <li>4. Semiconductors &amp; Diodes</li> <li>5. Power Supply Circuits</li> <li>6. Bipolar Transistors &amp; Transistor Amplifiers</li> <li>7. Junction Field-Effect Transistors (JFET) &amp; Metal-Oxide-Semiconductor Field-Effect Transistors (MOSFET)</li> </ol>
<b>Forms of Assessment</b>	<p>Assessment techniques: [<del>observation</del>], [<del>participation</del>], [<del>performance</del>], [written test], [<del>oral test</del>]</p> <p>Assessment forms: [<del>quiz</del>], [mid examination], [final examination], [assignment], [<del>report</del>], [<del>presentation</del>]</p> <p>Assignment = 40%, Mid examination = 30% Final examination = 30%,  CLO 1 <math>\Rightarrow</math> ILO 1: Mid examination number 1 (5%) (Mid examination: written test)  CLO 2 <math>\Rightarrow</math> ILO 2: Question in Assignment 1 (10%) Mid examination number 2 (5%) Mid examination number 3 (5%) (Assignment: written test and mid examination: written test)  CLO 3 <math>\Rightarrow</math> ILO 2: Question in Assignment 2 (10%) Mid examination number 4 (5%) Mid examination number 5 (5%) (Assignment: written test and mid examination: written test)  CLO 3 <math>\Rightarrow</math> ILO 2: Mid examination number 6 (5%) (Mid examination: written test)  CLO 3 <math>\Rightarrow</math> ILO 2: Question in Assignment 3 (10%) Final examination number 1 (5%) Final examination number 2 (5%) (Assignment: written test and final examination: written test)  CLO 3 <math>\Rightarrow</math> ILO 2: Question in Assignment 4 (10%) Final examination number 3 (5%) Final examination number 4 (5%) (Assignment: written test and final examination: written test)  CLO 3 <math>\Rightarrow</math> ILO 2: Final examination number 5 (5%) Final examination number 6 (5%) (Final examination: written test)</p>

<p><b>Study and examination requirements and forms of examination</b></p>	<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>
<p><b>Media employed</b></p>	<p>LED, Whiteboard, Learning Management System (SIKOLA)</p>
<p><b>Reading list</b></p>	<p><b>Main:</b></p> <ol style="list-style-type: none"> <li>1. Albert Malvino &amp; David Bates, Electronic Principles, 8th Edition, Mc Grw Hill, 2015.</li> <li>2. Giorgio Rizzoni, Fundamentals of Electrical Enggineering, 1st Edition, Mc Graw Hell, 2009.</li> <li>3. Sutrisno, Elektronika Teori dan Penerapannya, Jilid 1 dan 2, Penerbit ITB, Bandung, 1986.</li> </ol> <p><b>Support:</b> Nigel P. Cook, Electronic A complete Course, 2nd Edition, Pearson, 2004.</p>