

Module Description

Module name	Sensor System
Module level, if applicable	Bachelor of Physics
Code, if applicable	18H02131303
Subtitle, if applicable	
Course, if applicable	Sensor System
Semester(s) in which the module is taught	5 th
Person responsible for the module	Prof. Dr. Arifin, M. T.
Lecturer	<ol style="list-style-type: none"> 1. Prof. Dr. Arifin, M.T. 2. Dr. Bidayatul Arminah, M. T.
Language	Indonesian Language [Bahasa Indonesia]
Relation to Curriculum	This course is a compulsory course and offered in the 5 th semester.
Type of teaching, contact hours	<p>Teaching methods: [group discussion] and [problem-based learning].</p> <p>Teaching forms: [lecture] CH : 10.30 - 13.00</p>
Workload	<p>For this course, students are required to meet a minimum of 91.20 hours in one semester, which consist of:</p> <ul style="list-style-type: none"> - 27.20 hours for lecture, - 32.00 hours for structured assignments, - 32.00 hours for private study
Credit points	2 credit points (equivalent with 3.4 ECTS)
Requirements according to the examination	Students have participated in at least 80% of the learning activities

regulations	
Recommended prerequisites	Basic Physics 1 and Basic Physics 2
Module objectives/intended learning outcomes	<p>After completing the course, Students are able:</p> <p>Intended Learning Outcomes (ILO):</p> <p>ILO 1: Students have a relatively deep understood in classical and basic quantum physics. [ILO 1] - K</p> <p>ILO 2: Students are able to use the fundamental principles of physics in modeling and computation to solve the complex physical problem. [ILO 2] - K</p> <p>ILO 3: Students are able to use the basic principles of physics in technology application. [ILO 3] - K</p> <p>Course Learning Objective (CLO):</p> <p>After completing this course, students are expected to be able to:</p> <ol style="list-style-type: none"> 1. Explain the basic principles of sensor systems and sensor applications. 2. Solid understanding of the introduction of characteristics of sensors and sensor applications. 3. Describe the features, characteristics, and functions of sensors. 4. Analyze the characteristics of sensors and analyze the function of sensors in various applications. <p>Sub CLO :</p> <p>ILO 1 \Rightarrow CLO 1: Able to explain the basic sensor system.</p> <p>ILO 2 \Rightarrow CLO 2: Students are able to recognize the characteristics and general characteristics of the sensor.</p> <p>ILO 3 \Rightarrow CLO 3: Students are able to explain the characteristics, characteristics and functions of sensors: acceleration, vibration, displacement, flow, level, mass, load, and force.</p> <p>ILO 3 \Rightarrow CLO 4: Students are able to explain features, characteristics and functions: biosensors, chemical sensors, humidity, gas and pH.</p> <p>ILO 3 \Rightarrow CLO 5: Students are able to explain the characteristics, characteristics & functions of sensors: radiation, position, motion, pressure, strain & temperature.</p> <p>ILO 3 \Rightarrow CLO 6: Students are able to explain the characteristics, characteristics & functions of optical fiber-based sensors.</p>

Content	<p>Students will learn about :</p> <ol style="list-style-type: none"> 1. Basic sensor system 2. Common features and characteristics of sensors 3. Acceleration and vibration sensors 4. Biosensors 5. Chemical sensors 6. Displacement sensors 7. Flow and level sensors 8. Mass, load and force sensors 9. Humidity, gas and pH sensors 10. Radiation and optical sensors 11. Motion and position sensors 12. Pressure and strain sensors 13. Temperature sensors 14. Fiber optic based sensor
Forms of Assessment	<p>Assessment techniques: [performance], [participation], [written test]</p> <p>Assessment forms: [assignment], [presentation], [midterm exam], [final term exam]</p> <p>Assignment = 22%, Presentation = 38%, Mid term exam = 20% Final term exam = 20%,</p> <p>CLO 1 => ILO 1: 2% Assignment 1, 5% Mid examination number 1 CLO 2 => ILO 2: 3% Assignment 2, 5% Mid Examination number 2 CLO 3 => ILO 3: 15% Presentation, 5% Mid Examination number 3 CLO 4 => ILO 3: 9% Assignment 3, 5% Mid examination number 4 CLO 5 => ILO 3: 8% Assignment 4, 10% Final examination number 1 CLO 6 => ILO 3: 23% Presentation, 10% Final examination number 2</p>
Study and examination requirements and forms of examination	<p>Study and examination requirements:</p> <ul style="list-style-type: none"> - Students must attend 15 minutes before the class starts. - Students must switch off all electronic devices. - Students must inform the lecturer if they will not attend the class due to sickness, etc. - Students must submit all class assignments before the deadline. - Students must attend the exam to get a final grade. <p>Form of examination: Written exam: Essay</p>
Media employed	Text book, LCD Projector, Whiteboard, PowerPoint Presentation,

	Learning Management System (SIKOLA)
Reading list	<p>Main :</p> <ul style="list-style-type: none"> • John S. Wilson, 2005, <i>Sensor Technology Handbook</i>, Elsevier. • Alan S. Morris, 2001, <i>Measurement and Instrumentation Principles</i>, third edition, Butterworth Heinemann <p>Support :</p> <ul style="list-style-type: none"> • Alexius J. Hebra, 2010, <i>The Physics Meteorology</i>, Springer