



UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF PHYSICS EDUCATION
PHYSICS STUDY PROGRAM

Colombo St. Number 1 Yogyakarta 55281
Telephone (0274)565411 Ext. 217, fax (0274) 548203
Web: <http://fisika.fmipa.uny.ac.id/>, E-mail: fisika@uny.ac.id

Bachelor of Physics

MODULE HANDBOOK

Module name:	Sensors
Module level, if applicable:	Bachelor (Undergraduate) Programm
Code:	FSK6313
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	4 th
Module coordinator:	Sumarna, M.Si., M.Eng.
Lecturer(s):	Sumarna, M.Si., M.Eng., Denny Darmawan, M.Sc.
Language:	Bahasa Indonesia
Classification within the curriculum:	Compulsory Course
Teaching format / class hours per week during the semester:	100 minutes lectures, 100 minutes laboratory activities, and 120 minutes structured activities per week.
Workload:	Total workload is 117 hours per semester which consists of 100 minutes lectures, 100 minutes laboratory activities, 120 minutes structured activities, and 120 minutes individual study per week for 16 weeks.
Credit points:	3 SKS (4.86 ECTS)
Prerequisites course(s):	-
Course Outcomes	After taking this course the students have ability to: CO1. Mengetahui klasifikasi sensor dan memahami peranannya dalam sistem akuisisi data. CO2. Memahami watak statis sensor yang meliputi : fungsi respon, presisi, akurasi, resolusi, sensitivitas, linieritas, selektivitas, histerisis CO3. Memahami watak dinamis sensor (orde nol, orde satu,

	<p>dan orde dua).</p> <p>CO4. Memahami prinsip-prinsip fisis sensor resistif, kapasitif, induktif, dan magnetis.</p> <p>CO5. Memahami prinsip kerja sensor khusus (posisi dan pergeseran, suhu, aliran, magnetic, optis, akustik, kumia, biosensor.</p> <p>CO6. Memahami berbagai teknik dan desain rangkaian pengkondisian sinyal.</p> <p>CO7. Terampil menyelidiki parameter-parameter sensor baik yang statis maupun yang dinamis.</p> <p>CO8. Menganalisis watak sensor berdasarkan data hasil pengamatan.</p>															
Content:	<p>Mata kuliah ini membahas tentang pengantar sistem akuisisi data, prinsip fisis dan cara kerja sensor, watak statis dan dinamis sensor, klasifikasi sensor (resistif, kapasitif, dan induktif), mempelajari berbagai macam sensor untuk keperluan akuisisi data (instrumentasi dan pengukuran untuk : suhu, tekanan, gaya, dan torka/ puntiran, posisi dan pergeseran, kecepatan, vibrasi dan percepatan, akustik, aliran, cahaya/ optik, magnetik, kelembaban dan kebasahan, radiasi, digital, biosensor, kimia), dan teknik pengkondisian sinyal.</p>															
Study / exam achievements:	<p>The final mark will be weight as follow:</p> <table border="1"> <thead> <tr> <th>No</th> <th>CO</th> <th>Assessment Object</th> <th>Assessment Technique</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CO1, CO2, CO3, CO4, CO5, CO6, CO7, and CO8</td> <td>a. Individual Laboratory activities and report b. Mid c. Final Exam</td> <td>Report and written test</td> <td>30% 30% 40%</td> </tr> <tr> <td colspan="4">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CO	Assessment Object	Assessment Technique	Weight	1	CO1, CO2, CO3, CO4, CO5, CO6, CO7, and CO8	a. Individual Laboratory activities and report b. Mid c. Final Exam	Report and written test	30% 30% 40%	Total				100%
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Total				100%												
Forms of media:	Whiteboard, LCD Projector, Laptop/Computer															
Literature:	<p>A. Bentley, J.P, 2005, <i>Principles of Measurement Systems</i>, Fourth Edition, Pearson, Prentice Hall, New York.</p> <p>B. Fraden, J., 2004, <i>Handbook Of Modern Sensors : Physics, Designs, and Applications</i>, 3/ed, Springer Science + Business Media, LLC, New York.</p> <p>C. Doebelin, Ernest O., 1990, <i>Measurement Systems : Application and Design</i>, 4/ed, McGraw-Hill Publishing Company, New York.</p>															

	<p>D. Carr, Joseph J., 1993, Sensors and Circuits : Sensors, Transducers, and Supporting Circuits for Electronic Instrumentation, Measurement, and Control, PTR Prentice-Hall, Inc., New Jersey.</p> <p>E. Pallas-Areny, R., Webster, John G., 1991, Sensors and Signal Conditioning, John Wiley & Sons, Inc., New York.</p>
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PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CO1				✓	✓	✓	✓	
CO2				✓	✓	✓	✓	
CO3				✓	✓	✓	✓	
CO4				✓	✓	✓	✓	
CO5				✓	✓	✓	✓	
CO6				✓	✓	✓	✓	
CO7				✓	✓	✓	✓	
CO8				✓	✓	✓	✓	