



# UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Department of Computer Science and Electronics

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## Bachelor in Electronics and Instrumentation

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## MODULE HANDBOOK

Module name	<b>Sensor Systems</b>																		
Module level	Undergraduate																		
Code	MII-2303																		
Courses (if applicable)	Actuator Systems																		
Semester	Fall (Odd)																		
Contact person	Dr. R. Sumiharto, S.Si., M.Kom.																		
Lecturer	Dr. R. Sumiharto, S.Si., M.Kom.																		
Language	Bahasa Indonesia																		
Relation to curriculum	1. Undergraduate degree program, compulsory, 2th semester. 2. International undergraduate program, compulsory, 2th semester.																		
Type of teaching, contact hours	1. Undergraduate degree program: lectures, < 80 students, 2. International undergraduate program: lectures, < 30 students.																		
Workload	1. Lectures: 2 x 50 = 100 minutes (1 hours 10 menit) per week. 2. Exercises and Assignments: 2 x 50 = 100 minutes per week. 3. Private study: 2 x 50 = 100 minutes per week.																		
Credit points	2 credit points (sks).																		
Requirements according to the Examination regulations	A student must have attended at least 75% of the lectures to sit in the exams.																		
Recommended prerequisites	-																		
Learning outcomes (course outcomes) and their corresponding PLOs	<p>After completing this module, a student is expected to:</p> <p>CO1 Students are able to understand basic concepts, calibration, sensor signal processing and characteristics of sensor systems</p> <p>CO2 Students are able to analyze, design and apply the basic concepts of sensor systems</p> <p>CO3 Students are able to solve problems and design a sensor system in a process in everyday environments and in industry with a professional attitude</p> <table border="1"> <thead> <tr> <th colspan="2">PLO</th><th>CO 1</th><th>CO 2</th><th>CO 3</th></tr> </thead> <tbody> <tr> <td>Program</td><td>PLO1</td><td></td><td></td><td></td></tr> <tr> <td>Learning</td><td>PLO2</td><td>√</td><td></td><td></td></tr> </tbody> </table>				PLO		CO 1	CO 2	CO 3	Program	PLO1				Learning	PLO2	√		
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	<table><tr><td rowspan="3">Outcome (PLO)</td><td><b>PLO3</b></td><td></td><td>√</td><td></td></tr><tr><td><b>PLO4</b></td><td></td><td></td><td>√</td></tr><tr><td><b>PLO5</b></td><td></td><td></td><td>√</td></tr></table>	Outcome (PLO)	<b>PLO3</b>		√		<b>PLO4</b>			√	<b>PLO5</b>			√																						
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Contents	1. Introduction to Sensor System 2. Sensor characterization 3. Data acquisition 4. Calibration 5. Introduction Wireless Sensor Networks 6. sensor applications in instrumentation																																			
Study and examination requirements and forms of examination	<p>The evaluation is done in 3 forms, namely:</p> <ol style="list-style-type: none"><li>1. Trial, either midterm or semester test,</li><li>2. Four tasks, individual assignments to be completed within a certain timeframe, and</li><li>3. Two quizzes, held on face-to-face, once before midterm exam and once after midterm exam, with a short answer form.</li></ol> <p>Assessment is done using benchmark assessment, with the aim of measuring the level of student understanding related to the target and class rank.</p>																																			
Media employed	LCD, blackboard, and websites.																																			
Assessments and Evaluation	<table><tr><th>Type</th><th>Percentage</th><th>CO1</th><th>CO2</th><th>CO3</th></tr><tr><td>Quiz</td><td>10 %</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Individual Task</td><td>20 %</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Group Task</td><td>0</td><td></td><td></td><td></td></tr><tr><td>Midterm Exam</td><td>40 %</td><td>√</td><td>√</td><td></td></tr><tr><td>Final Exam</td><td>30 %</td><td></td><td>√</td><td>√</td></tr><tr><td><b>Total</b></td><td>100%</td><td></td><td></td><td></td></tr></table>	Type	Percentage	CO1	CO2	CO3	Quiz	10 %	√	√	√	Individual Task	20 %	√	√	√	Group Task	0				Midterm Exam	40 %	√	√		Final Exam	30 %		√	√	<b>Total</b>	100%			
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Reading List	[1] Jon Wilson, Sensor Technology Handbook, Newnes, 2005. [2] I. R. Sinclair, Sensor and Transducers, Newnes, 2001 [3] J. Fraden, Handbook of Modern Sensors, Springer International Publishing Switzerland 2016																																			