



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

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Bachelor in Electronics and Instrumentation

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MODULE HANDBOOK

Module name	Introduction to Industrial Instrumentation
Module level	Undergraduate
Code	MII-1303
Courses (if applicable)	Introduction to Industrial Instrumentation
Semester	Summer (Even)
Contact person	Dr. Danang Lelono, S.Si., MT.
Lecturer	Dr. Danang Lelono, S.Si., MT.
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, < 60 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	After completing this module, a student is expected to: CO1 Mastering the concepts and principles of instrumentation, recognize the role of instrumentation in control systems, indicators and measurement storage. CO2 Students understand and are able to implement signal conditioning methods using circuits electronic CO3 Students understand about methods and devices/sensors instrumentation for pressure, level, flow, temperature/heat, density, viscosity, and pH. CO4 Students are able to analyze the instrumentation process and the sampling method in the experimental data. CO5 Students are able to manage simple projects, communicate effectively,

	<table><tr><th colspan="2">PLO</th><th>CO 1</th><th>CO 2</th><th>CO 3</th><th>CO 4</th><th>CO 5</th></tr><tr><td rowspan="5">Program Learning Outcome (PLO)</td><td>PLO1</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>PLO2</td><td>√</td><td></td><td></td><td></td><td></td></tr><tr><td>PLO3</td><td></td><td>√</td><td>√</td><td></td><td></td></tr><tr><td>PLO4</td><td></td><td></td><td></td><td>√</td><td></td></tr><tr><td>PLO5</td><td></td><td></td><td></td><td></td><td>√</td></tr></table>	PLO		CO 1	CO 2	CO 3	CO 4	CO 5	Program Learning Outcome (PLO)	PLO1						PLO2	√					PLO3		√	√			PLO4				√		PLO5					√											
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Contents	1. Introduction to basic concept of Instrumentations 2. Signal Conditioning 3. Indicator and measurement deviation 4. Sampling and Measurement Data Analysis 5. Types of Instrument																																																	
Study and examination requirements and forms of examination	<p>The evaluation is done in 3 forms, namely:</p> <ol style="list-style-type: none">1. Trial, either midterm or semester test,2. Four tasks, individual assignments to be completed within a certain timeframe, and3. Five quizzes, held on face-to-face, once before midterm exam and once after midterm exam, with a short answer form. <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><th>CO4</th><th>CO5</th></tr><tr><td>Quiz</td><td>10 %</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Individual Task</td><td>20 %</td><td></td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Group Task</td><td>0</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Midterm Exam</td><td>35 %</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr><tr><td>Final Exam</td><td>35 %</td><td></td><td></td><td>√</td><td>√</td><td>√</td></tr><tr><td>Total</td><td>100%</td><td></td><td></td><td></td><td></td><td></td></tr></table>	Type	Percentage	CO1	CO2	CO3	CO4	CO5	Quiz	10 %	√	√	√	√	√	Individual Task	20 %		√	√	√	√	Group Task	0						Midterm Exam	35 %	√	√	√			Final Exam	35 %			√	√	√	Total	100%					
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Reading List	<p>[1] Blackburn,J.A : 2001, Modern instrumentation for scientists and engineers, Springer-Verlag New York Inc. New York USA</p> <p>[2] Wheeler A.J; Ganji A.R., Introduction to Engineering Experimentation 3rd Edition, Prentice Hall, 2010</p> <p>[3] William C. Dunn, Fundamentals of Industrial Instrumentation and Process Control, Newnes, 2005.</p> <p>[4] I. R. Sinclair, Sensor and Transducers, Newnes, 2001</p> <p>[5] Tony R. Kuphaldt, Lessons In Industrial Instrumentation,</p>																																																	

	<p>www.Pacontrol.com, 2009.</p> <p>[6] Johnson, C.D. Process Control Instrumentation Technology, 8th Edition, Pearson, 2014</p>
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