MODULE HANDBOOK
Master Program in Computer Science
Department of Computer Science and Electronics
Faculty of Mathematics and Natural Sciences
Universitas Gadjah Mada

Instrumentations

Module name	**Instrumentations**		
Module level	Master		
Code	MII 6294		
Courses (if applicable)	Instrumentations (Instrumentasi)		
Semester	Even (Genap)		
Contact person	Drs. Agus Harjoko, M.Sc., Ph.D Dr. R. Sumiharto, S.Si., M.Kom		
Lecturer	Drs. Agus Harjoko, M.Sc., Ph.D Dr. R. Sumiharto, S.Si., M.Kom		
Language	Indonesia		
Relation to curriculum	Master program, elective, 2nd semester		
Type of teaching, contact hours	Master program : lectures, <17 student		
Workload	1. Lectures: 3×50 = 150 minutes (2.5 hours) per week 2. Exercises and Assignments: 3×60 = 180 minutes (3 hours) per week 3. Private study: 3×60 = 180 minutes (3 hours) per week		
Credit points	3 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 and their corresponding PLOs	After completing this module, a student is expected to:		
	CO	**Description**	**Supported PLO**
	CO-1	Students analyze about the basic concepts of instrumentation and know the control system	PLO2
	CO-2	Students classify the characteristics of each instrumentation device	PLO3
	CO-3	Students are able to analyze the requirements of sensors and transducers related to instrumentation	PLO3

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<tr><td></td><td>CO-4</td><td>Students are able to analyze the control system associated with instrumentation</td><td>PLO4</td></tr>
<tr><td></td><td>CO-5</td><td>Students are able to produce simulations from an Instrumentation</td><td>PLO5</td></tr>
<tr><td>Content</td><td colspan="3">Instrumentation is a field of expertise related to the development of equipment, especially equipment for measurement and control. Students will learn how instruments work through knowledge in materials (sensors and actuators), analog and digital electronics, microcontroller and computer devices (hardware and software), optical systems (lenses, optical fibers, modern optical devices), mechanical and pneumatic systems), as well as how the signal / information must be processed using hardware and software. By learning the knowledge and skills, students will understand how an instrument works and is arranged as well as how the parts making up the instrument work.

Based on the knowledge and skills possessed by students, students will learn to design and implement an instrument for measurement or control for applications in the health sector (monitoring tools and health therapy), industry (monitoring and controlling industrial processes), environment (measurement of environmental parameters) and other fields as part of the final project.

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<tr><td>Study and examination requirements and forms of examination</td><td colspan="3">Mid-term examination
Final examination
Assignments</td></tr>
<tr><td>Media employed</td><td colspan="3">LCD, blackboard, websites, and books</td></tr>
<tr><td>Assessments and Evaluation</td><td colspan="3"><table>
<tr><th>CO</th><th>Assessment Methods</th><th>Type</th><th>Percentage</th><th>Total</th></tr>
<tr><td>CO-1</td><td>Assignment 1</td><td>Formative</td><td>10%</td><td>10%</td></tr>
<tr><td rowspan="3">CO-2</td><td>Problem 1 of midterm exam</td><td>Summative</td><td>10%</td><td rowspan="3">25%</td></tr>
<tr><td>Problem 2 of midterm exam</td><td>Summative</td><td>10%</td></tr>
<tr><td>Assignment 2</td><td>Formative</td><td>5%</td></tr>
<tr><td rowspan="2">CO-3</td><td>Problem 3 of midterm exam</td><td>Summative</td><td>10%</td><td rowspan="2">15%</td></tr>
<tr><td>Assignment 3</td><td>Formative</td><td>5%</td></tr>
<tr><td>CO-4</td><td>Problem 4 of midterm exam</td><td>Summative</td><td>10%</td><td>25%</td></tr>
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		Problem 1 of final exam	Summative	10%	
		Assignment 4	Formative	5%	
	CO-5	Problem 2 of final exam	Summative	10%	25%
		Problem 3 of final exam	Summative	10%	
		Case Study	Formative	5%	
Reading List	• W. Bolton, " Instrumentation and Control System", Elsevier Science & Technology Books, 2004 • Franklyn W. Kirk, Thomas A. Weedon, Philip Kirk "Instrumentation, 5th Edition", American Technical Publishers, 2011				