



UNIVERSITAS PENDIDIKAN INDONESIA
 FACULTY OF MATHEMATICS AND NATURAL SCIENCES EDUCATION
 DEPARTMENT OF PHYSICS EDUCATION
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Bachelor of Physics

MODULE HANDBOOK

Module name:	Automation and Control	
Module level, if applicable:	Undergraduate	
Code:	FI349	
Sub-heading, if applicable:	-	
Classes, if applicable:	-	
Semester:	4 th	
Module coordinator:	Ahmad Aminudin	
Lecturer(s):	Ahmad Aminudin	
Language:	Bahasa Indonesia	
Classification within the curriculum	Elective course	
Type of Teaching	Contact hours per week during the semester	Class Size
1. Lecture (conceptual, contextual and problem-solving approaches, discussions, simulation and presentation). 2. Structured activities (assignments based on conceptual, contextual and problem-solving approaches) 3. Self-study (reading literature and project)	1 hour 40 minutes	25
Workload:	The total workload is 91 hours/5440 minutes (3.2 ECTS) per semester, consisting of 25 hour 20 minutes/1400 minutes lectures (0.82 ECTS), 28 hours/1680 minutes structured activities (0.98 ECTS) and 28 hours/1680 minutes self-study (0.98 ECTS) per week for 14 weeks, 11 hour 54 minutes/714 minutes for two exams and exam preparations (0.42 ECTS).	
Credit points:	3.2 ECTS	
Pre-requisites course(s):	Electrical Circuit Analysis and Mathematical Physics II	

Course Learning Outcomes:	<p>After taking this course the students have ability to:</p> <p>CLO1. Have knowledge of control system processes and parameters</p> <p>CLO2. Analyse the principles Transfer Function diagram block, Laplace Transform, signal flow graph and mason formula</p> <p>CLO3. Have knowledge about control test requirements, proportional control, integral and differential control.</p> <p>CLO4. Able to apply analogue controller</p> <p>CLO5. Have knowledge about the presumed transition of the first- order and second- order systems.</p> <p>CLO6. Analyse the stability of the control system.</p> <p>CLO7. Analyse frequency response and time propagation system control.</p> <p>CLO8. Implement digital control.</p>																				
Content:	<p>In this course, students will learn a parameter control system ; Transfer function and diagram block; Laplace transform, Signal flow graphs and mason formulas, flow charts and block diagrams; Test signal and control devices, Control device PID; Analog controllers; First order system switching response, proportional control device in first order system; Second order system switching response, second order system response time; Second order system switching response, second order system response time; System stability with the Routh and Hurwitz method ; Stability system with continuous fractional method and the domicile of the roots ; Frequency response : bode diagram, amplitude margin and margin phase, Nyquist stability; System with propagation time : the elaboration of a mathematical equation, use proportional control; Digital Controller System</p>																				
Study/exam achievements:	<p>The final mark will be weight as follow:</p> <table border="1" data-bbox="655 1335 1453 1794"> <thead> <tr> <th>No</th> <th>CLO</th> <th>Assessment Object</th> <th>Assessment Techniques</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CLO1, CLO2, CLO3, CLO4,</td> <td>Subject specific competences: a. Individual assignments b. Class Activity c. Mid Exam</td> <td>Written Performance Written test</td> <td>10% 10% 30%</td> </tr> <tr> <td>2</td> <td>CLO5, CLO6, CLO7, CLO8,</td> <td>a. Individual assignments b. Class Activity c. Final Exam</td> <td>Written Performance Written test</td> <td>10% 10% 30%</td> </tr> <tr> <td colspan="4">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CLO	Assessment Object	Assessment Techniques	Weight	1	CLO1, CLO2, CLO3, CLO4,	Subject specific competences: a. Individual assignments b. Class Activity c. Mid Exam	Written Performance Written test	10% 10% 30%	2	CLO5, CLO6, CLO7, CLO8,	a. Individual assignments b. Class Activity c. Final Exam	Written Performance Written test	10% 10% 30%	Total				100%
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Forms of media:	Board, LCD Projector, Laptop/Computer, Demonstration Equipment Package, LMS																				

