FI349 Automation and Control

Module name:	Automation and Control	
Module level, if applicable:	Undergraduate	
Code:	FI349	
Sub-heading, if applicable:	-	
Classes, if applicable:	-	
Semester:	4th	
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, and practice method). 2. Structured activities (assignments based on conceptual, contextual and problem-solving approaches) 3. Self-study (reading literature)	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):	FI348 Electrical Circuit Analysis, FI240 Mathematical Physics II	
Course Learning Outcomes (CLO):	After taking this course the students have ability to: CLO1. Explain control system processes and parameters. CLO2. Analyse the principles Transfer Function diagram block, Laplace Transform, signal flow graph and mason formula. CLO3. Explain control test requirements, proportional control, integral and differential control. CLO4. Apply analogue controller. CLO5. Explain the presumed transition of the first order and second-order systems. CLO6. Analyses the stability of the control system.	

<table>
<tr><td></td><td>CLO7. Analyses frequency response and time propagation system control.
CLO8. Apply the digital control.</td></tr>
<tr><td>Content:</td><td>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</td></tr>
<tr><td>Study/exam achievements:</td><td>
<table>
<tr><th>No</th><th>CLO</th><th>Assessment Object</th><th>Assessment Techniques</th><th>Weight</th></tr>
<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>
</table>
The final mark will be weight as follow:
</td></tr>
<tr><td>Forms of media:</td><td>Board, LCD Projector, Laptop/Computer, Demonstration Equipment Package, LMS</td></tr>
<tr><td>Literature:</td><td>1. Giri, F. (2013). AC electric motors control: advanced design techniques and applications. John Wiley & Sons Inc.
2. Potter, A. (2017). Modern Control Systems and Engineering. The English Press
3. Katsuhiko Ogata. (2010). Modern control engineering. Prentice Hall.</td></tr>
</table>

PLO and CLO mapping

	PLO1	PLO 2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CLO1	√											
CLO2	√											
CLO3			√									
CLO4			√									
CLO5			√									
CLO6			√									
CLO7			√									
CLO8			√									