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MODULE HANDBOOK

Module name	**Actuator Systems**
Module level	Undergraduate
Code	MII-2303
Courses (if applicable)	Actuator Systems
Semester	Fall (Odd)
Contact person	Ika Candradewi, S.Si., M.Cs.
Lecturer	1. Ika Candradewi, S.Si., M.Cs. 2. Dr. Danang Lelono, S.Si., M.T.
Language	Bahasa Indonesia & English
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 mechanical actuators, toroids, DC motors, AC Motor, Stepper Motor, Servo Motor, Hydrolic and Pneumatic Actuators in actuators systems design. CO2 Able to work independently to implement concept of actuator systems through simulation design results or real implementation in mechanical actuators, toroids, DC motors, AC Motor, Stepper Motor, Servo Motor, Hydrolic and Pneumatic Actuators CO3 Demonstrate an attitude of responsibility for work in his area of expertise independently and can work together in teams to obtain good system design results by designing ideas to solve problems on actuators systems using mechanical actuators, electrical actuators, DC motors, AC Motor, Stepper Motor, Servo Motor, Hydrolic and

<table>
<tr><td></td><td>Pneumatic Actuators Concept.[

<table>
<tr><th colspan="2">PLO</th><th>CO1</th><th>CO 2</th><th>CO3</th></tr>
<tr><td rowspan="5">Program Learning Outcome (PLO)</td><td>PLO1</td><td></td><td></td><td></td></tr>
<tr><td>PLO2</td><td>√</td><td></td><td></td></tr>
<tr><td>PLO3</td><td></td><td>√</td><td></td></tr>
<tr><td>PLO4</td><td></td><td></td><td>√</td></tr>
<tr><td>PLO5</td><td></td><td></td><td></td></tr>
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</td></tr>
<tr><td>Contents</td><td>1. Introduction to Actuator System
2. Mechanical Actuators
3. DC Motors
4. Stepper Motor
5. Electrical Motor
6. Hydraulic Actuator
7. Pneumatic Actuator</td></tr>
<tr><td>Study and examination requirements and forms of examination</td><td>The evaluation is done in 3 forms, namely:
1. Trial, either midterm or semester test,
2. Four tasks, individual assignments to be completed within a certain timeframe, and
3. Two quizzes, held on face-to-face, once before midterm exam and once after midterm exam, with a short answer form.

Assessment is done using benchmark assessment, with the aim of measuring the level of student understanding related to the target and class rank.</td></tr>
<tr><td>Media employed</td><td>LCD, blackboard, and websites.</td></tr>
<tr><td>Assessments and Evaluation</td><td>
<table>
<tr><th>Type</th><th>Percentage</th><th>CO1</th><th>CO2</th><th>CO3</th></tr>
<tr><td>Quiz</td><td>5 %</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>Project Task</td><td>15 %</td><td></td><td></td><td>√</td></tr>
<tr><td>Midterm Exam</td><td>30 %</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>Total</td><td>100%</td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Reading List</td><td>[1] Stamatios Manesis, and George Nikolakopoulos, 2018, Introduction to Industrial Automation, CRC Press, USA
[2] Francisco André Corrêa Alegria, 2022, Sensor and Actuators, World Scientific Publishing Do, Pte, Ltd.</td></tr>
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	[3] Clerence W. de Silva, 2016, Sensor and Actuators Engineering System Instrumentation, second edition, CRC Press USA [4] Bishop, R.H., 2008, Mechatronic Systems, Sensors and Actuators, Fundamentals and Modeling, CRC Press USA [5] David G. Alciatore dan M.B. Histand, 2007, " Introduction to Mechatronics and Measurement Systems", McGraw-Hill, USA. [6] Hanselman, D., 2003, Brushless Permanent Magnet Motor Design, 2nd Edition The Writers' Collective [7] Yon Rijono, 1997; Dasar Teknik Tenaga Listrik, Andi Offset Yogyakarta