



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Department of Computer Science and Electronics

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MODULE HANDBOOK

Module name	Experiment on Advanced Robotics
Module level, if applicable	Undergraduate
Code, if applicable	MII 3315
Courses, if applicable	Advanced Robotics – MII 3310
Semester(s) in which the module is taught	Odd Semester
Person responsible for the module	Ika Candradewi, S.Si., M.Cs.
Lecturer(s)	Ika Candradewi, S.Si., M.Cs. Nia Gella Augoestien, S.Si., M.Cs.
Language	English Bahasa Indonesia
Relation to curriculum	1. Undergraduate degree program, elective, 6th semester. 2. International undergraduate program, elective, 6th semester.
Teaching methods	1. Undergraduate degree program delivered using lectures and practicum instruction with students less than 30. 2. International undergraduate degree program delivered using lectures and instruction with students less than 30.
Workload (incl. contact hours, self-study hours)	1. Lectures: 1 x 100 = 100 minutes per week. 2. Exercises and Assignments: 1 x 50 = 50 minutes per week. 3. Self-study: 1 x 50 = 50 minutes per week.
Credit points	1 Credit Points
Requirements according to the examination regulations	A student must have attended at least 75% of the lectures to sit in the exams.
Required and recommended prerequisites for joining the module	Students must take Advanced Robotics – MII 3310 course
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to: CO1. Students are able to implement inverse kinematics and able to program arm Robot / Manipulator robots [CPL 3] CO2. Students are able to program flying robots using Teloo [CPL 3] CO3. Students are able to program wheeled robot using python on ROS for SLAm and path planning problem [CPL 4] CO4. Students are able to design and implement programming on Robot to solve problems for specific application[CPL 5]

	<table><tr><td colspan="2">PLO</td><td>CO1</td><td>CO2</td><td>CO3</td><td>CO4</td></tr><tr><td rowspan="5">Program Learning Outcome (PLO)</td><td>PLO1</td><td></td><td></td><td></td><td></td></tr><tr><td>PLO2</td><td></td><td></td><td></td><td></td></tr><tr><td>PLO3</td><td>√</td><td>√</td><td>√</td><td></td></tr><tr><td>PLO4</td><td>√</td><td>√</td><td>√</td><td></td></tr><tr><td>PLO5</td><td></td><td></td><td></td><td>√</td></tr></table>	PLO		CO1	CO2	CO3	CO4	Program Learning Outcome (PLO)	PLO1					PLO2					PLO3	√	√	√		PLO4	√	√	√		PLO5				√														
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Content	1. Programming Control Robot Manipulator Arm 2. Programming Flying Robot and Implementation of Control Flying Robots 3. Advanced SLAM and Path Planing in Wheeled Robot																																														
Study and examination requirements and examination forms	The evaluation is done in three forms, namely: 1. Final exam 2. Case Study 3. Ten group assignments are to be completed within a specific timeframe, And Assessment is done using a rubric to measure student understanding related to the target and class rank.																																														
Media employed	e-learning Platform (ELOK), projector, whiteboard, and presentation. Robotic Turtlebot3 Kit, Ubuntu OS with ROS, Gazebo Simulation Software																																														
Assessments and evaluation	<table><tr><td>Type</td><td>Percentage</td><td>CO1</td><td>CO2</td><td>CO3</td><td>CO4</td></tr><tr><td>Final Exam -Project Results/Case Study Results/PBL Results*)</td><td>30%</td><td></td><td></td><td></td><td>√</td></tr><tr><td>Task (Skill-based Assessment (SBA)) Structured Assignments</td><td>10%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Experiment Report</td><td>20%</td><td>√</td><td></td><td></td><td></td></tr><tr><td>Case Study</td><td>20 %</td><td>√</td><td>√</td><td></td><td></td></tr><tr><td>Final Exam – Theoretical & Analisis</td><td>20 %</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></tr></table>					Type	Percentage	CO1	CO2	CO3	CO4	Final Exam -Project Results/Case Study Results/PBL Results*)	30%				√	Task (Skill-based Assessment (SBA)) Structured Assignments	10%	√	√	√	√	Experiment Report	20%	√				Case Study	20 %	√	√			Final Exam – Theoretical & Analisis	20 %				√	Total	100				
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Reading list	Main References : 1. ROS Robot Programming, A Handbook is written by TurtleBot3 Developers. https://community.robotsource.org/t/download-the-ros-robot-programming-book-for-free/51 2. Materi Praktikum Robotika Lanjut																																														

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