Robotics

Module name	Robotics
Module level	Undergraduate
Code	IF221225
Courses (if applicable)	Robotics
Semester	5/6
Lecturer	Budi Nugroho, S.Kom, M.Kom (PIC)
Language	Bahasa Indonesia and English
Relation to curriculum	Elective; 5th or 6th semester
Type of teaching, contact hours	Lectures, < 60 students,
Teaching Methods	project-based learning, problem-based learning
Workload	1. Lectures: 3 sks x 50 = 150 minutes (2 hours 30 minutes) per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 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 80% of the lectures to sit in the exams.
Mandatory prerequisites	Artificial Intelligence
Courses description	This course covers topics related to cloud robotics and automation technologies, such as the ROS (Robot Operating System) programming paradigm, cloud computing automation, and commonly used algorithms in robotics. The course also includes a significant assignment to introduce technical comprehension to students.
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to:	
	CO1 Students are able to understand the fundamental issues, limitations, strengths, and trends in robotics programming.	PLO9, PLO10
	CO2 Students are able to explain cloud computing technology and the mechanisms of robotic computing.	PLO9, PLO10
	CO3 Students are able to analyze the performance and data of algorithms for cloud robotics.	PLO9, PLO10
Content	Introduction to robotics, ROS (Robot Operating System), robotic computing, robot programming, GORE (Goal-Oriented Robot Execution), SLAM (Simultaneous Localization and Mapping), collective robot learning, crowdsourcing object identification, path planning algorithms, RAAS (Robot as a Service).
Media employed	LCD, whiteboard, websites, books (as references), online meeting, etc.
Assessments and Evaluation	One written Midterm assessment (60 minutes) and one final oral exam (30 minutes), two short computer-based quizzes, takehome written assignments
Study and examination requirements and forms of examination	The final grade in the module is composed of: • Two short computer-based quizzes: 15% x 2 = 30% • Take-home written assignments : 15% • Written Midterm assessment: 25% • Final oral exam: 30%

	Students must have a final grade of 55.6% or higher to pass.
Reading List	• Chandra Gatti and Singh, Shaping the Future of Automation With Cloud-Enhanced Robotics. Hershey, PA, USA: IGI Global, 2024. • Fouad Sabry, Cloud Robotics: Harnessing Networked Intelligence for the Next Era of Autonomous Machines. Barnes & Noble, 2024. • Z. Gacovski, Mechatronics and Robotics, Burlington, ON, Canada: Arcler Press, 2020.Available: https://portal.igpublish.com/iglibrary/obj/ARCLER0000921?searchid=1755665847 677OZRlMn_kERtSrIGMhEHMk