Module name	Specific Topic in Robotics
Module level, if applicable	Bachelor of Informatics
Code, if applicable	21D12143803
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	6th
Person responsible for the module	Ir. Christoforus Yohannes., MT
Lecturer	1. Ir. Christoforus Yohannes., MT 2. Muh. Anshar., ST., M.Sc., Ph.D
Language	Indonesian Language [Bahasa Indonesia]
Relation to Curriculum	This course is a compulsory course for the Artificial Intelligence and Robotics research group and is offered in the 6th semester.
Type of teaching, contact hours	Teaching methods: [collaborative learning], [project-based learning]. Teaching forms: [lecture], [tutorial], [practicum]. CH : 08.00 - 16.00
Workload	For this course, students are required to meet a minimum of 136.00 hours in one semester, which consist of: - 40.00 hours for lecture, - 48.00 hours for structured assignments, - 48.00 hours for private study
Credit points	3 credit points (equivalent with 5.1 ECTS)
Requirements according to the	Students have participated in at least 80% of the learning activities (Academic Regulations, Chapter VII)

examination regulations	
Recommended prerequisites	Basic Computer Programming
Module objectives/intended learning outcomes	After completing the course, Students are able: **Intended Learning Outcomes (ILO):** **ILO 3 :** Apply the knowledge of computing and other related disciplines to analyse and identify solutions for any computing-based problem. **ILO 6 :** Perform effectively in a team, either as a member or leader, in activities related to the program's discipline **ILO 8 :** Aware of the dynamics of Information Technology and acknowledge the different points of view of others that includes beliefs, cultures, ideas and original inventions. **Course Learning Objective (CLO):** After completing this course, students are expected to be able to: 1. Briefly describe the history of robotics in general and industrial- related robots; 2. Explaining terminology related to robotics and the Basic Laws of Robotics; 3. Understand the working mechanism of robot hardware and software for Robot Mind; 4. Software design of the working mechanism of a simple robot; 5. Implementing software designs into applicable robots. **Sub CLO :** ILO 8 ⇒ CLO 1 : Able to explain the history of robots, understand robotics terminology and the Basic Laws of Robotics, explain the evolution of robotic theory, types of Robot Joint movements along with examples of their implementation, the working mechanism of the robot manipulator, Degree of Freedom and Degree of Mobility. ILO 3 ⇒ CLO 2 : Understand basic programming to build a robot working mechanism in software, then combine understanding of hardware with programs that build a robot's working mechanism, and finally propose the type of physical design and work function of the robot (work method).

	ILO 6 ⇒ CLO 3 : Understand the physical anatomy, working mechanism of the elements and the complete robot configuration with its working principle, working mechanism of AIBO and NAO robots, workflow of Robot Mind in general and explain Middleware analysis from perception to Robot Mind and its elements, complete with its working mechanism, the design of intelligent robots, and finally implement a simple example of accessing Robot joints.
Content	Students will learn about : 1. Understanding Robots, Historical Descriptions, 3 Basic Laws, and Laws to Zero, and Implementation of Past and Present Basic Laws 2. Robot anatomy builder terms and physical design examples of each configuration 3. Working Principles and Method 4. Definition of Manipulator Robot and Its Elements 5. DOF and DOM 6. Robot Joint Movements 7. Hardware building elements 8. Interface between low level sensory mechanisms and their interpretation 9. Analysis work flow from low level to high level (hardware to Robot Mind) 10. Design, Basic program and Design work concept Robot Mind 11. Connection between physical and software 12. OPEN-R Programming and API NAO 13. Sample Application and Implementation
Forms of Assessment	Assessment techniques:[participation], [written test]. Assessment forms: [[final term exam], [assignment], [presentation]. Final term exam = 30%, Assignment 1 = 15%, Assignment 2 = 15%, Assignment 3 = 15%, presentation = 25% CLO 1 => ILO 8: 25% (Presentation : observation) CLO 2 => ILO 3: 45% (Assignment: participation) CLO 3 => ILO 6 : 30% (Final term exam: written test)
Study and examination requirements and	**Study and examination requirements:** - Students must attend 15 minutes before the class starts. - Students must switch off all electronic devices.

forms of examination	- Students must inform the lecturer if they will not attend the class due to sickness, etc. - Students must submit all class assignments before the deadline. **Form of examination:** Written exam: Essay
Media employed	Video conference, slide presentation, Learning Management System (LMS)
Reading list	**Main :** 1. Bill, G. 2004, 'Inverse Kinematics', Robotics and Automation Handbook, CRC Press, pp. 27-56. 2. Bram de, J., Maarten, S. & Dragan, K. 2004, 'Modeling and Identification for Robot Motion Control', Robotics and Automation Handbook, CRC Press, pp. 268-93. 3. Gregory, S.C. 2004, 'Rigid-Body Kinematics', Robotics and Automation Handbook, CRC Press, pp. 14-26. 4. Hodge, J. 2004, 'Design of Robotic End Effectors', Robotics and Automation Handbook, CRC Press, pp. 207-25. 5. Jaydev, P.D. 2004, 'D-H Convention', Robotics and Automation Handbook, CRC Press, pp. 138-58. 6. Jeanne Sullivan, F. 2004, 'Sensors', Robotics and Automation Handbook, CRC Press, pp. 226-44. 7. Wayne, J.B. 2004, 'Flexible Robot Arms', Robotics and Automation Handbook, CRC Press, pp. 479-522. 8. Wesley, L.S. 2004, 'The History of Robotics', Robotics and Automation Handbook, CRC Press, pp. 1-12. 9. Matarić, Maja J. The robotics primer. Mit Press, 2007.