



Undergraduate Programme In Physics

Module Handbook

Module Name :	<i>Robotika</i> Robotics
Module level :	Bachelor degree/Undergraduate Programme
Course Code :	4520102242
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	6/Third Year
Module coordinator(s)	
Lecturer(s):	
Language:	<i>Bahasa Indonesia</i>
Classification within the curriculum:	Compulsory/ Elective
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or sks*)
Workload :	a. Lecture: 1 x 50 minutes lectures, 1 x 60 minutes structured activity, 1 x 60 minutes individual activity, 14 weeks per semester, 39.67 total hours of lecture per semester ~ 1.59 ECTS b. Lab activity: 1x170 minutes lab activity, 14 weeks per semester 39.67 total hours of lab activity per semester ~ 1.59 ECTS Total of lecture and lab activity= 79.33 total hours per semester ~ 3.18 ECTS**
Credit Point:	2 sks (3.18 ECTS)
Requirements:	Basic Electronics I Basic Electronics II



MINISTRY OF EDUCATION AND CULTURE
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF PHYSICS

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 Website: <http://s1-fisika.fmipa.unesa.ac.id/>, email: s1-fisika@unesa.ac.id

<p>Learning goals/competencies:</p>	<ol style="list-style-type: none"> 1. Demonstrating independent, creative and honest characters in doing student assignments, mid and final exams. 2. Understanding the concepts of robotics and its classification based on system and function. 3. Understanding concepts and implementation of various sensors and actuators that is applied in robotics. 4. Understanding the concepts of mechanical design for particular function of robot 5. Understanding the concepts implementation of kinematics in robotics. 6. Understanding the concepts and how design a mobile robot (wheeled and legged robot). 7. Understanding the concepts and how to design an arm manipulator robot. 															
<p>Content</p>	<p>Robotics is a course that studies the concept, function and application of the robot. Students will learn about robot components, including sensors, actuators, mechanical design and algorithms. Students will be given tasks and will need to design and construct various projects (mobile robot and arm manipulator robot) by using those components. Students will work independently as well as in small groups. Topics</p> <ol style="list-style-type: none"> 1. Introduction of Robotics (concepts, function and implementation) in various field 2. Sensors and actuators used for a robot 3. Mechanical design of a robot 4. An inverse kinematics for controlling robot 5. Design and control of the mobile robot (wheeled and legged) <p>Design and control of the arm manipulator robot</p>															
<p>Attribute Soft skill:</p>	<p>Scientific report, public speaking, and team work</p>															
<p>Study/exam achievements:</p>	<p>Students are considered to complete the course and pass if they obtain at least 40% of maximum final grade. The final grade (NA) is calculated based on the following ratio:</p> <table border="1" data-bbox="566 1653 1305 2016"> <thead> <tr> <th>Assessment Components</th> <th>Percentage contribution</th> <th>of</th> </tr> </thead> <tbody> <tr> <td>Participation</td> <td>20%</td> <td></td> </tr> <tr> <td>Assignment</td> <td>30%</td> <td></td> </tr> <tr> <td>Mid-semester test</td> <td>20%</td> <td></td> </tr> <tr> <td>Final semester test</td> <td>30%</td> <td></td> </tr> </tbody> </table>	Assessment Components	Percentage contribution	of	Participation	20%		Assignment	30%		Mid-semester test	20%		Final semester test	30%	
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Learning Methods :	<ol style="list-style-type: none"> 1. Student-centered approach 2. Lecture and discussion 3. Laboratorium activities 4. Presentations
Form of Media:	<i>Power Point</i> slides, e-book file, and multimedia.
Literature references): (primary	<ol style="list-style-type: none"> 1. Mihelj, M. et.al. 2019. Robotics. 2nd Edition. Switzerland: Springer, pp. 1-247. ISBN 978-3-319-72911-4. 2. Margolis, M. 2012. Make An Arduino Controlled Robot. United State of America: O'Reilly Media Inc., pp. 1-235. ISBN: 978-1-449-34437-5. 3. Cook, D. 2015. Robot Building for Beginners. 3rd Edition. New York: Springer, pp.1-449. ISBN-13: 978-1-4842-1359-9. 4. Siciliano, B. and Khatib, O. Handbook of Robotics. Berlin: Springer-Verlag, pp. 1-1559. e-ISBN: 978-3-540-30301-5. Levin, B. W. and Nosov, M. A. 2016. Physics of Tsunamis. 2nd Edition. Heidelberg, Germany: Springer, pp. 1-388. eISBN: 978-3-319-24037-
Notes:	<p>*1 sks in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</p> <p>**1 sks = 1,59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019</p>