



INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)
FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS
DEPARTEMEN TEKNIK ELEKTRO
Program Studi Sarjana (S1) Teknik Elektro

INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)
FACULTY OF INTELLIGENT ELECTRICAL & INFORMATICS TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING
Bachelor Degree Program in Electrical Engineering

1 Nama Mata Kuliah : Robotika / Robotics
/ Course Name

2 Kode Mata Kuliah : EE234735
/ Course Code

3 Kredit / Credits : 2 SKS

4 Semester / Semester : 0

Deskripsi Mata Kuliah / Course Description

Mata kuliah ini membahas konsep penerapan robotika di bidang otomasi industri, dan penerapan metode kendali terkini pada robotika di bidang otomasi industri / *This course discusses the concept of implementing robotics in industrial automation and the application of the latest control methods in robotics for industrial automation.*

Capaian Pembelajaran Lulusan (CPL) Yang Dibebankan Mata Kuliah / Program Learning Outcomes Charged to The Course

CPL 3 Mampu mengelola pembelajaran diri sendiri, dan mengembangkan diri sebagai pribadi pembelajar sepanjang hayat untuk bersaing di tingkat nasional, maupun internasional, dalam rangka berkontribusi nyata untuk menyelesaikan masalah dengan mengimplementasikan teknologi informasi dan komunikasi dan memperhatikan prinsip keberlanjutan serta memahami kewirausahaan berbasis teknologi / *Able to manage one's own learning and continually self-develop as a lifelong learner to compete at the national and international levels, with the goal of making a tangible contribution to problem-solving by implementing information and communication technology and considering sustainability principles, as well as understanding technology-based entrepreneurship.*

CPL 6 Mampu mengkaji dan memanfaatkan matematika, ilmu pengetahuan alam dan teknologi serta mengidentifikasi, memformulasikan dan menyelesaikan permasalahan di bidang teknik elektro / *Able to evaluate and utilize mathematics, natural sciences, and technology, as well as identify, formulate, and solve problems in the field of electrical engineering.*

CPL 7	Mampu mengetahui dan mengaplikasi metode, keahlian sesuai perkembangan terkini di bidang ilmu pengetahuan dan teknologi untuk menyelesaikan permasalahan teknik elektro dengan mengedepankan nilai-nilai universal / <i>Able to understanding and applying the latest methods and skills in the field of science and technology to solve electrical engineering problems while emphasizing universal values.</i>
Capaian Pembelajaran Mata Kuliah / Course Learning Outcomes	
<ol style="list-style-type: none"> 1. Mampu melakukan analisa kinematika robot / <i>Able to perform robot kinematics analysis.</i> 2. Mampu mendapatkan invers position dan invers orientation / <i>Able to obtain inverse position and inverse orientation for robots.</i> 3. Mampu menjelaskan dinamika gerakan robot dengan Matriks Jacobian / <i>Able to explain the dynamics of robot motion with the Jacobian matrix.</i> 4. Mampu menjelaskan kontrol robot / <i>Able to explain robot control.</i> 	
Pokok Bahasan / Contents	
<ol style="list-style-type: none"> 1. Pendahuluan : Sejarah perkembangan teknik robot / <i>Introduction: History of Robot Engineering</i> 2. Transformasi Koordinat / <i>Coordinate Transformation</i> 3. Kinematika robot : Forward kinematics, kinematic chains, representasi Denavit-Hartenberg dan invers kinematics / <i>Robot Kinematics: Forward Kinematics, Kinematic Chains, Denavit-Hartenberg Representation, and Inverse Kinematics</i> 4. Differential motion: Matriks Jacobian / <i>Differential Motion: Jacobian Matrix</i> 5. Differential motion : Singularitas, inverse velocity and acceleration 6. Dinamika Robot / <i>Robot Dynamics</i> 7. Kontrol Robot / <i>Robot Control</i> 	
Prasyarat / Pre-requisite	
Pustaka / Reference	
<ol style="list-style-type: none"> 1. Mark W. Spong, Seth Hutchinson, M. Vidyasagar, Robot Modeling and Control, 2nd Edition, Wiley, 2020 2. Frank L. Lewis, Darren M. Dawson, Chaouki T. Abdallah, Robot Manipulator Control Theory and Practice, CRC Press, 2003 	