

## MAKLUMAT PROGRAM

|   |   |
|---|---|
| <b>FPJB &amp; Jabatan</b>   | Pusat Keselamatan Siber dan Revolusi Industri Digital   |
| <b>Nama Program</b>   | <b>ROS (Robot Operation System) Technology Development</b>  |
| <b>Sinopsis</b>   | The course is designed to provide the participants with an extensive hands-on exercise to experience the concepts and tools to practice the artificial intelligent of robot. The course will exposure the participants with the ROS technology to stimulate the development of Artificial intelligent in robotic industry. At the end of the course, the participants will have proficient knowledge on ROS technology programming and AI robot creation.   |
| <b>Hasil Pembelajaran (Learning Outcomes)</b>                                 | Student be able to: <ol style="list-style-type: none"> <li>1. Explore various applications and advantages of ROS, especially for robotics applications in the industrial, construction, security and other large- scale industries.</li> <li>2. Understand the theory and experience the ROS development.</li> <li>3. Design and demonstrate AI robot in development.</li> </ol>  |
| <b>Kaedah Pelaksanaan (Mode of Delivery)</b>                                  | Lectures/ Case Study/ Presentation  |
| <b>Tempoh Pengajian (Duration of Study)</b>                                   | 3 working days  |
| <b>Kumpulan Sasaran (Target Participant)</b>                                  | Students, researchers, Industry 4.0 related engineer, and people who want to acquire knowledge in Robot Operating System (ROS) Technology   |
| <b>Syarat Permohonan/ Admission Requirement</b>                               | Basic Electronics and C programming knowledge is required for this course.  |
| <b>Struktur Kursus (Course Outline) / Struktur Kurikulum (Topics Covered)</b> | <p><b>Day 1</b></p> <p>Chapter 1:<br/> Session 1: Introduction to Electronics<br/> Session 2: Introduction to Microcontroller<br/> Session 3: C Programming</p> <p>Chapter 2:<br/> Session 1: Introduction to Embedded Computer<br/> Session 2: Python Programming<br/> Session 3: Introduction to OpenCV</p> <p><b>Day 2</b></p> <p>Chapter 3:<br/> Session 1: Introduction to ROS<br/> Session 2: ROS Gazebo Simulation<br/> Session 3: Programming Virtual ROS Robot</p> <p>Chapter 4:<br/> Session 1: Mobile Robot Development<br/> Session 2: ROS Robot Programming<br/> Session 3: Tele Operation of Robot</p> <p><b>Day 3</b></p> <p>Chapter 5:<br/> Session 1: SLAM<br/> RobotSession 2:<br/> Mapping<br/> Session 3: Autonomous Navigation</p> <p>Chapter 6:</p> |

## MAKLUMAT PROGRAM

|   |  |
|---|--|
|   | <p>Session 1: Introduction to TurtleBot<br/>         Session 2: Teleop Turtlebot<br/>         Session3: SLAM using Turtlebot<br/>         Chapter 7:<br/>         Session 1: Multi Robots System using ROS<br/>         Session 2: Virtual Multi Robots Simulation<br/>         Session 3: Multi Robot System Implementation</p> |
| <p><b>Yuran Kursus<br/>(Course Fee)</b></p> | <p><b>RM4,000 per person</b></p>   |

|                                      |                           |
|--------------------------------------|---------------------------|
| <b>Yuran Kursus<br/>(Course Fee)</b> | <b>RM4,000 per person</b> |
|--------------------------------------|---------------------------|