

COLLEGE OF ENGINEERING TRIVANDRUM

BOSCH REXROTH CET CENTRE OF EXCELLENCE IN AUTOMATION TECHNOLOGIES

SHORT TERM TRAINING PROGRAMME ON ROBOTICS AND INDUSTRIAL AUTOMATION

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| <p>Contents</p>             | <p><b>Drives:</b> Cylinders for different drive purposes<br/> <b>Valves:</b> Various valve types (pneumatic/hydraulic/electric controlled)<br/> <b>Controls:</b> Pneumatic, hydraulic, and electric controls of valves<br/>             Position control: Limit switches and sensors<br/>             Speed control: Uses of throttle valves<br/>             Logic control: AND/OR valves<br/>             Pressure control: Uses of adjustable pressure sensors<br/>             Time-dependent control, Symbolic representation of devices, standards<br/>         Relay Logics, Electro-Pneumatics, Programmable Logic Controllers, Interfacing hydraulic and pneumatic system with PLC, Study of different types of sensors and their application.<br/>         Hands on Training on Pneumatic, Hydraulic, Electro-Pneumatic circuits, electro hydraulic and Interfacing hydraulic and pneumatic system with PLC.<br/>         Basics Of CNC programming: G codes and M codes.<br/>         Advanced programming techniques using</p> <ul style="list-style-type: none"> <li>• Basic machining cycles</li> <li>• Advanced machining cycles</li> <li>• Canned cycles</li> <li>• Mirroring commands</li> <li>• Subroutines (Subprogram)</li> <li>• Hands on training sessions using Vertical Machining Centre</li> </ul> <p><b>Robotics:</b> Introduction - Definitions, Robot Elements - links, joints, end effector, actuators. Robot specifications, Work envelope of different robots, Classification of Robots, Sensors in Robotics- status sensors, environment sensors, quality control sensors, safety sensors, ROS, Lego Programming, Introduction to RobotStudio Software.<br/> <b>Mobile robots:</b> steered and differentially driven robots.<br/>         Hands on training on differentially driven robots, quadcopter, manipulator.</p> |
| <p>Outcomes</p>             | <p>The participant:</p> <ul style="list-style-type: none"> <li>• can design, assemble and test basic pneumatic/hydraulic/electro-pneumatic circuits</li> <li>• can maintain and troubleshoot pneumatic/hydraulic/electro-pneumatic/electro- hydraulic components and basic control systems.</li> <li>• can design, assemble, program and test robotic systems.</li> </ul>   |
| <p>Facilities of centre</p> | <p>Hydraulic kit- 6 nos.<br/>         Pneumatic kit- 6 nos.<br/>         PLC kit- 6 nos.<br/>         Sensoric kit- 4 nos.<br/>         Differentially driven mobile robot – 1 nos.<br/>         Quadcopter – 1 nos.<br/>         ABB manipulator – 1 nos.<br/>         Lego Mindstorms EV3 Kit- 6No.<br/>         RobotStudio Software.</p>  |

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| Duration               | 120 hours  |
| Timing                 | Batch I- Monday, Wednesday & Friday 12.30PM-6.30PM, Saturday-9.00AM-4.00PM<br>Batch II- Monday- Friday: 4.30PM-7.30PM, Saturday: 9AM-4PM   |
| Eligibility            | Degree/Diploma in Mechanical/Electrical/Instrumentation/Electronics Engineering or Allied branches.  |
| Course Fee             | Rs.7500/- ( Direct Payment Through Centre for Continuing Education, CET or DD drawn in favour of BOSCH-CET CENTRE FOR CONTG EDN Payable at Trivandrum DD and duly filled application form should reach by registered post to The Centre for Continuing Education, College of Engineering Trivandrum pin: 695016 on or before 05/02/2020)   |
| Last Date for Apply    | 05.02.2020   |
| Date of Commencement   | 12.02.2020   |
| No. Of Seats per Batch | 25   |
| Contact                | Dr. Vinod B. R, Co-ordinator, Bosch Rexroth CET Centre of Excellence in Automation Technologies, Assistant Professor, Department of Electronics and Communication Engineering CET, TVM-695016. <a href="mailto:vinodbrcet@gmail.com">vinodbrcet@gmail.com</a> , mob: 9447344250<br>Prof. Shafeek M, Course Co-ordinator, Assistant Professor, Department of Mechanical Engineering, CET, TVM-695016.e-mail: shafeek@cet.ac.in, mob: 9495828145 |