

## Request For Proposal: Content Development and Courseware for Industrial Robots Training and Qualification

S/N	Item	Description
1	Background	<p><b>Content Development and Courseware for Industrial Robots Training and Qualification</b></p> <p><u>Objectives:</u></p> <p>To provide Industrial Robots Training (Theoretical and Practical) and Examination (Theoretical and Practical) for operators and programmers or system-integrators training leading to certification or qualification.</p> <p><u>Learning Outcomes for Operators Training:</u></p> <p>By the end of the course, participants will be able to</p> <ol style="list-style-type: none"> <li>1. Identify personal safety solutions</li> <li>2. Identify robot safety features</li> <li>3. Identify robot system components</li> <li>4. Move/Jog the robot using the joystick</li> <li>5. Interpret and respond to event messages</li> <li>6. Perform basic operations</li> <li>7. Modify movement instructions in a basic programme</li> <li>8. Demonstrate how to use the input and output instructions in a basic programme</li> <li>9. Demonstrate how to save robot information</li> <li>10. Introduction to different gripper types (vacuum, electric, servo, etc.) and common types used in different applications in the industry</li> <li>11. List factors affecting vision for a pick and place robot application</li> <li>12. Check handshake signals with a PLC (Programmable Logic Controller)</li> </ol> <p><u>Learning Outcomes for Programmers/System-Integrators Training-A:</u></p> <p>By the end of the course, participants will be able to</p> <ol style="list-style-type: none"> <li>1. Identify and practice safety standards when designing the robot system, and understand how to minimise the risks</li> <li>2. Practice all areas of safety as they pertain to the robot</li> <li>3. Properly start-up, operate, and shut down the robot</li> <li>4. Properly identify and recover from robot errors</li> </ol>

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		<ol style="list-style-type: none"> <li>5. Perform programme storage and retrieval</li> <li>6. Manual and programme control of inputs and outputs</li> <li>7. Create Tool Centre Point (TCP) data</li> <li>8. Edit programmed positions</li> <li>9. Create a programme with subroutine structure</li> <li>10. Programme instructions, such as, output control, decision making, and operator dialog</li> <li>11. Name I/O and data with proper names</li> <li>12. Identify system parameters</li> <li>13. Design gripper fingers using CAD (Computer-aided design) software and make use of 3D printer to print out the design</li> <li>14. Perform basic vision setup and execute a pick and place application with a gripper fixed with the finger designed by the participant</li> <li>15. Programme handshake signals for communication with a PLC</li> </ol> <p><u>Learning Outcomes for Programmers/System-Integrators Training-B:</u></p> <p>By the end of the course, participants will be able to</p> <ol style="list-style-type: none"> <li>1. Create simulation station layout using CAD software and insert a virtual robot to check reachability, check possible collisions, and calculate cycle time</li> <li>2. Design a tool using CAD software and attach tooling to robot simulation</li> <li>3. Create robot motion</li> <li>4. Create robot programmes</li> <li>5. Create basic geometry modelling</li> <li>6. Import external graphic files</li> <li>7. Record simulations</li> <li>8. Edit programme code using an editor</li> <li>9. Set-up and use Event Manager</li> <li>10. Create simulation of real robot</li> <li>11. Demonstrate a basic Digital Twin concept (i.e., create real-time movement of the simulated robot and peripherals as the actual physical robot and peripherals move.)</li> </ol>
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2	Scope of Collaboration	<p><b>Product/Service Requirements</b></p> <p><u>Role of Collaborators:</u></p> <ol style="list-style-type: none"> <li>1. Provide qualified trainers to teach</li> <li>2. Provide course notes and subject matter details</li> <li>3. Provide and co-locate equipment for training</li> <li>4. Train and qualify SP (Singapore Polytechnic) trainers to co-teach</li> <li>5. Provision and advice on facility setup and equipment to be purchased             <ul style="list-style-type: none"> <li>• Expected Cost</li> <li>• Deliverables</li> <li>• Course Content</li> <li>• Course Structure</li> </ul> </li> </ol>
3	Programme Management	<p><b>Programme shall be managed by SP's School of Mechanical &amp; Aeronautical Engineering (MAE)</b></p> <p>Commencement date: <b>01 Aug 2020</b></p> <p>Completion date: <b>Nov 2020</b></p>
4	Proposal Process and Schedule	<p><b>Schedule for selection of a collaborator:</b></p> <ol style="list-style-type: none"> <li>1. Request for Proposal Opening Date <b>01 Jun 2020</b></li> <li>2. Proposed due date <b>15 Jun 2020, 5pm</b></li> <li>3. Interviews with selected bidders <b>Jun 2020 (TBA)</b></li> </ol> <p>For questions pertaining to technical nature, please contact: Dr. Win Tun Latt, Senior Lecturer School of Mechanical &amp; Aeronautical Engineering (MAE) win_tun_latt@sp.edu.sg</p>
5	Proposal Evaluation Criteria	<p><b>MAE will evaluate proposal and selection based on factors which may include but not limited to:</b></p> <ol style="list-style-type: none"> <li>1. Expected cost incurred</li> <li>2. Project team/trainers</li> <li>3. Experience/credibility</li> <li>4. Course content</li> <li>5. Track records and ratings</li> </ol>

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		6. Client references
6	<b>Requirements and Format of the Proposal Submission</b>	<p><b>A written proposal that contains the following information, taking into account the evaluation criteria:</b></p> <ol style="list-style-type: none"> <li>1. Company background</li> <li>2. Qualification/Certification</li> <li>3. Proposed course structure and content to meet our learning outcomes</li> <li>4. Cost per learner chargeable</li> </ol>
7	<b>Limitations</b>	MAE reserves the right to reject the proposals submitted without an explanation. SP does not incur any liability/costs from the proposal submitted.