### TSC Category

**Automation Management**

**TSC** Automated System Design

**TSC Description** Design and commission automated systems as well as evaluate the system design specification against functional requirements

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<th>TSC Proficiency Description</th>
<th>Level 1</th>
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<td>Develop automation systems taking into account space constraints, process constraints, unique process tool requirements and priority loading</td>
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<td>Design automation controls by applying the fundamental of pneumatic, electro-pneumatic, Programmable Logic Controllers (PLCs) and factory automation during the design stage</td>
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#### Knowledge

- Project Management flow from design, requirement specification, installation, commissioning and final acceptance of Automated Material Handling System (AMHS) system
- AMHS capacity (From-To table) moves derived from Process moves and storage pattern
- Risk assessment analysis for new AMHS equipment roll-in or working procedure to be performed
- 2-D and/or 3-D mechanical drawings
- AMHS simulation tool
- AMHS Semiconductor Equipment and Materials International (SEMI) Specifications
- AutoCAD software
- Manufacturing process steps
- Preparation methods of compressed air
- Principles of pneumatic systems
- Types of pneumatic components
- Operation principles of pneumatic systems
- Principles of electro-pneumatic systems
- Types of electro-pneumatic components
- Operation principles of electro-pneumatic systems
- Principles of PLCs
- Components of PLC
- Types of Programming Languages
- PLC programming

#### Abilities

- Plan and develop routes for robots
- Use statistical and automation software to monitor robot’s performance
- Establish acceptance criteria, specifications and Standard Operating Procedures (SOPs)
- Perform analysis to determine control requirements of the machine
- Establish pneumatic, electro-pneumatic, PLC requirements from design specifications
- Produce Graphical User Interface (GUI) for automation control of the machine’s system in accordance with design specifications
- Monitor the operation of
| automation systems | Analyse the strengths and weaknesses of the engineering design against design criteria | Submit a full evaluation report on whether the engineering design meet functional requirements |