

# BUILDING TECHNICAL CAPABILITY

## ACADEMY OF ADVANCED MANUFACTURING: TECHNICAL CURRICULUM



### Industrial Automation Principles

Industrial Automation and Control Systems • Functions (IACS) • Manufacturing Environment/ Process • Mechanics • Computing • Ohm's Law • Electrical Symbols • Diagrams and Terminology • Use of a Digital Meter • Test Equipment • Circuit Wiring • Termination



### Controller Technology and Programming

Relationship between plant floor Mechanical Components and IACS (especially PLC) • Communications between Maintenance and PLC • Data Types • Application Creation • Upload/Download • Ladder Logic • I/O Management • Controller Modes



### Controller Products and Applications

IACS Troubleshooting • Peer-to-Peer versus I/O Communications • Programming Types • Function Block • Sequential Function Chart • Structured Text • Application Development (All Programming Types)



### Network Infrastructure Technology

Network Architecture • Reference Models (OSI vs TCP/IP) • Media • Network Components (Repeater, HUB, Bridge, Switch, Router, Gateway) • Topologies • Data Link, Network, Transport Layers • Traffic Analysis • Message Formats (Unicast, Multicast, Broadcast) • LAN, WAN



### Visualization and Information Software

Human Machine Interface (HMI) Purpose and its Relationship to the Plant Floor Mechanical Components • Components and Solutions • Application Creation • Industrial Computer/Open Platform Communications • Graphic Display Creation and Modification • Alarms • Troubleshooting • Enterprise Integration • Production Data • Reporting



### AC Drives, Motors Technology

Drive Technologies • Relationship Between the Drive, Motor, and Plant Floor Mechanics • Six Block Diagram • Motor Nameplate, Wiring • Meter Usage • HMI Usage • Network Control • Start Up • Troubleshooting • Reading, Interpreting Drives Prints • Digital, Analog Relays, I/O Wiring • Motor Control Center Components



### Instrumentation

Instrumentation Technologies • Hands-On • Instrumentation Devices • Flow Level • Pressure • Temperature • Analytics • Systems • System Components



### Machine Safety Technology

Functional Capabilities of Safety Technology in Relationship to the Reality of Plant Floor Mechanics • Safety Design • Risk Assessment • Safety Circuits • Fail Safe vs Fault Tolerant • Safety Relay I/O • Non Contact Switches • Safety PLC • Safety I/O • E-stop • Troubleshooting

# BUILDING PROFESSIONAL CAPABILITY

## ACADEMY OF ADVANCED MANUFACTURING: PROFESSIONAL CURRICULUM



### Accelerating Team Performance

Partnering • Developing collaborative relationships • Continuous Improvement • Organizational Sensitivity



### Communicating Your Best

Shaping communication to needs of audience • Listening attentively • Conveying ideas and opinions • Making requests and setting expectations • Using appropriate business grammar and vocabulary



### Customer One

Fostering key relationships • Developing and executing work plans • Customer focus • Understanding customer needs as basis for decision and action



### Influencing Across Boundaries

Professional adaptability • Cross-cultural savvy • Resilience and change management • Tenacity • Agility and flexibility



### Navigating Change

Resilience and change management • Tenacity • Agility and flexibility • Adjusting behavior to changing conditions



### Personal Management

Personal accountability and achievement • Learning agility • Technical excellence • Fostering accountability • Self development • Setting goals and expectations



### Priming Performance

Networking • Decision making • Judgment • Commitment



### Transforming Conflict

Managing conflict • Identifying alternatives and positions to reach mutually-beneficial outcomes • Problem-solving and decision-making