



High Performance Manufacturing Production Technician Certification

Integrated, Modular, and Fast Track Course (* NOTES e-Learning / FAST TRACK UNIT) Syllabus

Unit	Content	Subject	MSSC-M1: SAFETY Unit Description
1	Text Ch 5	Learning Techniques	Introduction of MSSC, learning and study techniques necessary for success in MSSC certification course
2	Text Ch 1	Working in Manufacturing	Types of manufacturing, benefits of manufacturing careers, and responsibilities of six (6) types of frontline manufacturing jobs
3	Text Ch 1-2	The Impact of Manufacturing	Importance of manufacturing on everyday lives and skills needed for success in high performance manufacturing
4	Text Ch 2-3	Responding to Customer Expectations	Methods of responding to customer expectations, systems used by high performance manufacturing to produce quality products, and advanced manufacturing techniques
5	Text Ch 3	Best Practice Companies	Case studies in best practice techniques used by successful U.S. companies to achieve high performance manufacturing
6	Text Ch 5	Communication Skills	Techniques for effective verbal communication, including giving/ receiving feedback and listening
7	Text Ch 5	Production Group Communication	Communicate effectively with internal and external customers; communicate effectively with production team members
8	Text Ch 5	Communication Strategies	Techniques for effective written communication; use email and other written communication technologies
9*	e-Learning MSSC-OS1 Ancillary: Text Ch 6	Production Teams	Techniques for building successful frontline teams, consensus decision making, idea generation, concept of concurrent engineering, customer service concepts
10*	e-Learning MSSC-OS2 Ancillary: Text Ch 6	Training and Leadership	How to deliver effective training; prepare to train; evaluate training results; lead teams; conflict resolution
11	<i>Included in</i> MSSC-OS2 Ancillary: Text Ch 7	Meeting Customer Needs	Types of internal and external customers and their importance, identification of internal and external customer needs
12*	e-Learning MSSC-OS3 Ancillary: Text Ch 4	Safety Organization	Agencies that regulate safety, internal safety groups, emergency procedures, perform a job safety analysis, workplace behavior, and safety inspections
13*	e-Learning MSSC-OS4 Ancillary: Text Ch 4	Personal Protective Equipment	Types, applications and use of personal protective equipment for ears, eyes, body, face, hand, foot, and respiration
14*	e-Learning MSSC-OS5	Fire and Electrical Safety	Fire and electrical safety guidelines, use of fire extinguishers, lockout / tagout procedure, basic first aid, and accident reporting
15*	e-Learning MSSC-OS6 Ancillary: Text Ch 4	Work Area Safety	Housekeeping safety, work area permits, ergonomics, platform and man lift safety
16*	e-Learning MSSC-OS7 Ancillary: Text Ch 4	Hazardous Material Safety	Types of hazardous materials, Hazmat safety guidelines, Hazmat labeling systems, Material Safety Data Sheets, handling and storage procedures
17*	e-Learning MSSC-OS8 Ancillary: Text Ch 11	Tool and Machine Safety	Safety guidelines for machine operation, hand tools, cutting tools, compressed air, portable power tools, guards; pneumatic lockout / tagout; use of ladders
18*	e-Learning MSSC-OS9	Material Handling Safety	Safety guidelines for powered lift trucks, cranes, rigging, and equipment movement; use a hoist; select a sling; use a pry truck; use a lift truck



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Unit	Content	Subject	MSSC-M2: QUALITY AND CONTINUOUS IMPROVEMENT Unit Description
19*	e-Learning MSSC-OQ1	Blueprint Reading 1 (Multi-view Drawings)	Reading multi-view drawings to visualize part shapes, identify features, and identify dimensions
20*	e-Learning MSSC-OQ2	Blueprint Reading 2 (Sectional Drawings and Fasteners)	Reading drawings to determine part hole sizes and locations, scales, title blocks, part section features, and fastener sizes
21*	e-Learning MSSC-OQ3	Blueprint Reading 3 (GD&T)	Interpretation of part dimension tolerances, geometric dimensioning and tolerancing (GD&T) symbols and frames, and datums
22*	e-Learning MSSC-OQ4	Basic Measurement	Interpret English and S.I. measurements; perform system conversion; use tape measures and rules; accuracy and repeatability
23*	e-Learning MSSC-OQ5	Precision Measurement Tools	Making precision measurements using dial calipers, digital calipers, and micrometers
24*	e-Learning MSSC-OQ6	Dimensional Gauging	Gaging parts using dial indicators, digital indicators, and data acquisition software; calibration of instruments; part mastering
25*	e-Learning MSSC-OQ7 <small>Ancillary: Text Ch 16</small>	Quality Systems	Quality system elements, definition of quality, ISO 9000 standard, types of quality management systems, PDCA cycle, continuous improvement concepts, audits, inspections
26	<i>Included in MSSC-OQ7 Ancillary: Text Ch 16</i>	Quality Improvement	Methods of process improvement, importance of data collection and analysis, types of statistical tools
27*	e-Learning MSSC-OQ8	Introduction to SPC	Concepts of statistical process control, calculate mean, range, construct and analyze histograms, determine and interpret Cpk
28*	e-Learning MSSC-OQ9	Control Charts	Types and applications of control charts; construct and analyze an X bar and R chart
29*	e-Learning MSSC-OQ10	Continuous Improvement - 1	Applications of root cause failure analysis; construct and analyze Pareto charts; use brainstorming and fishbone diagrams to solve production problems, apply corrective and preventive action
30	<i>Included in MSSC-OQ7 Ancillary: Text Ch 16</i>	Continuous Improvement - 2	Role of managers and production workers in quality, quality teams
31	<i>Included in MSSC-OQ7 Ancillary: Text Ch 17</i>	Quality Inspections	Methods of quality inspection at different stages of manufacturing; document and communicate inspection results
32	<i>Included in MSSC-OQ7 Ancillary: Text Ch 17</i>	Quality Audits	Types of quality audits, Quality audit procedures, document quality audit results; develop an action plan and recommendation from a quality audit
33	<i>Included in MSSC-OQ10 Ancillary: Text Ch 18</i>	Preventive and Corrective Actions	Types of nonconformities and methods of detection; perform a root cause failure analysis; decide when / how to take preventive and corrective action
34	<i>Included in MSSC-OQ10 Ancillary: Text Ch 18</i>	Verification and Documentation	Perform an effectiveness check; document and report preventive and corrective actions



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Unit	Content	Subject	MSSC-M3: MANUFACTURING PROCESS AND PRODUCTION Unit Description
35	Text Ch 7	Customer Contact	Interpretation of specifications, work orders, and technical drawings.
36	Text Ch 8	Creating Products	Identification of the major stages of production, production resources, and factors for production method selection.
37	Text Ch 8	Types of Production	Identification of the characteristics and advantages of major types of production systems.
38*	MSSC-OP1	Mechanical Principles	Six (6) types of simple machines, operation and application of levers, and concepts of force and weight.
39*	MSSC-OP2	Mechanical Linkages	Effect of friction on machine operation; operation of machine linkages, cams, and turnbuckles.
40	Text Ch 9	Production Materials	Types, properties, and applications of materials and chemicals used to manufacture products, including food and beverage products
41	Text Ch 9	Testing, Selecting, and Developing Materials	Factors used to select materials for a given product, methods of testing material quality, and advances in material design
42	Text Ch 10	Production Processes	Types, operation and application of casting, molding, machining, finishing, assembly, separation, conditioning, combining, and filling
43*	MSSC-OP3	Machining Processes	Interpret stock material sizes and types from specifications; use a band saw to cut stock material to size; types of machine tools
44*	MSSC-OP4	Machine Tooling	Use basic layout techniques to prepare a part for machining, size a drill bit, identify drill bit by size, select and install drill press tooling, operate a drill press
45*	MSSC-OP5	Machine Operations	Use a drill press to perform basic drilling operations: reaming, counterboring, countersinking, and tapping
46	<i>Included in MSSC-OP6</i> Ancillary: Text Ch 11	Tools and Equipment Use	Types, applications and use of hand tools, portable power tools, and equipment
47*	MSSC-OP6 Ancillary: Text Ch 11	Equipment Procedures	Interpret standard operating procedures; read technical manuals to obtain information; Total Productive Maintenance; machine operation procedures
48*	MSSC-OP7 Ancillary: Text Ch 12	Production Planning and Workflow	Basic concepts of production planning, work flow, and facilities layout; identify bottlenecks and ways to balance workflow, Lean Manufacturing concepts, product cost estimating
49	<i>Included in MSSC-OP7</i> Ancillary: Text Ch 13	Production Components	Types of inventory and inventory management concepts; read a bill of material; identify cost of downtime and calculate product cost
50*	MSSC-OP8 Ancillary: Text Ch 14	Production Control	Operation of push and pull production systems, just-in-time production, methods of feedback to control quality
51	<i>Included in MSSC-OP8</i> Ancillary: Text Ch 14	Documenting the Process	Types of production documents, methods of retaining documents, and use of electronic data exchange; read and handle production documents
52	<i>Included in MSSC-OP8</i> Ancillary: Text Ch 15	Product Packaging	Types and applications of product packaging; packaging regulations and laws; select packaging for given product; interpret package labels
53	<i>Included in MSSC-OP8</i> Ancillary: Text Ch 15	Product Distribution	Methods and applications of transporting produced products; interpret shipping documents; use a tracking system



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MSSC-M4: MAINTENANCE AWARENESS			
Unit	Content	Subject	Unit Description
54*	MSSC-OM1	Welding	Types of welding, applications, operation of the welding process, welding safety
55*	MSSC-OM2	Basic Electrical Circuits	Operation of basic electrical circuits, input devices, output devices; basic concept of AC and DC electricity; read and interpret an electrical schematic
56*	MSSC-OM3	Electrical Measurements	Basic concepts of electrical resistance, voltage, current, series circuits, parallel circuits; use of multimeter to measure electrical signals
57*	MSSC-OM4	Electrical Power	Basic concepts of power consumption in series and parallel electrical circuit; select and size circuit protection devices; reset circuit protection devices, operation of motor starters and overload protection; basic AC motor operation; operate a motor control circuit
58*	MSSC-OM5	Pneumatic Power Systems	Basic concepts of pneumatic system operation with linear actuators; adjust and read pressure; connect an air hose; operate pneumatic circuit; drain a filter, read and interpret a pneumatic schematic
59*	MSSC-OM6	Hydraulic Power Systems	Basic concepts of hydraulic power system operation with component identification, power unit operation, circuit connections, and basic cylinder circuits
60*	MSSC-OM7	Lubrication Concepts	Types, properties, and applications of grease and oil for lubrication; use of viscosimeter; use of grease gun; lubrication management, recycling
61*	MSSC-OM8	Bearings and Couplings	Types, operation, and application of bearings and couplings; mechanical power transmission safety guidelines; importance of proper shaft alignment. Additionally, gear drives components and calculations are covered.
62*	MSSC-OM9	Belt Drives	Types, operation, and application of belt drives; calculate speed and torque ratios; align a belt drive and adjust tension
63*	MSSC-OM10	Chain Drives	Types, operation, and application of chain drives; calculate speed and torque ratios; align a chain drive and adjust tension
64*	MSSC-OM11	Machine Control Concepts	Basic concepts of electrical relay logic; solenoid valve operation; connect a basic electrical logic circuit; interpret a basic ladder diagram schematic
65*	MSSC-OM12	Machine Automation	Basic concepts of electrical relay control; limit switch and sensor operation; connect a basic cylinder reciprocation relay circuit, operation of automatic/manual machine modes; connect a basic timer control circuit