



High Performance Manufacturing Production Technician Certification
Modular and Fast Track* Course Description – Syllabus Outline

MSSC-M1: SAFETY COURSE

Unit	Content	Subject	Description
1		MSSC Overview and Techniques	Introduction to MSSC and study techniques
2		Working in Manufacturing	Types and benefits of manufacturing careers, responsibilities of six types of frontline jobs
3		Impact of Manufacturing	Importance of manufacturing on life and skills needed for success in high performance manufacturing
4		Responding to Customer Expectations	Response to customer expectations, systems to produce quality products, advanced techniques
5		Customer Needs	Types of customers and their importance, identification of internal and external customer needs
6		Best Practice Companies	Case studies in best practices used by successful companies to achieve high performance manufacturing
7		Communication	Effective verbal communication, giving and receiving feedback, listening
8		Production Group Communication	Communicate effectively with customers and with production team members
9		Communication Strategies	Frontline team building, decision making, idea generation, concurrent engineering, customer service
10*	WMSSCOS1-BX01XEN	Production Teams	Frontline team building, decision making, idea generation, concurrent engineering, customer service
11*	WMSSCOS1-BX02XEN	Training and Leadership	Prepare and deliver effective training, evaluate training results, lead teams, conflict resolution
12*	WMSSCOS1-BX03XEN	Safety Organization	Safety agencies, safety teams, emergency procedures, job safety analysis, workplace behavior, inspections
13*	WMSSCOS1-BX04XEN	Personal Protective Equipment	PPP types, applications and use for ears, eyes, body, face, hand, foot, and respiration
14*	WMSSCOS1-BX05XEN	Fire and Electrical Safety	Fire and electrical safety, use of extinguishers, lockout/tagout, basic first aid, and accident reporting
15*	WMSSCOS1-BX06XEN	Work Area Safety	Housekeeping, work area permits, ergonomics, platform and man lift
16*	WMSSCOS1-BX07XEN	Hazardous Material Safety	Hazardous materials, Hazmat, labeling systems, SDS, handling and storage
17*	WMSSCOS1-BX08XEN	Tool and Machine Safety	Machine operation safety, hand and cutting tools, compressed air, portable power tools, guards, pneumatic
18*	WMSSCOS1-BX09XEN	Material Handling Safety	Lift trucks, cranes, rigging, equipment movement, hoists, slings, pry trucks

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MSSC-M2: QUALITY PRACTICES and MEASUREMENT COURSE

Unit	Content	Subject	Description
19*	WMSSCOQ1-BX01XEN	Blueprint Reading 1 (Multi-view Drawings)	Reading multi-view drawings to visualize part shapes, identify features, and identify dimensions.
20*	WMSSCOQ1-BX02XEN	Blueprint Reading 2 (Assembly Drawings and Fasteners)	Reading drawings to determine part hole sizes and locations, scales, title blocks, part section features, and fastener sizes.
21*	WMSSCOQ1-BX03XEN	Blueprint Reading 3 (GD&T)	Interpretation of part dimension tolerances, geometric dimensioning and tolerancing (GD&T) symbols and frames, and datums.
22*	WMSSCOQ1-BX04XEN	Basic Measurement	Interpret English and S.I. measurements; perform system conversion; use tape measures and rules; accuracy and repeatability.
23*	WMSSCOQ1-BX05XEN	Precision Measurement Tools	Making precision measurements using dial calipers, digital calipers, and micrometers.
24*	WMSSCOQ1-BX06XEN	Dimensional Gauging	Gauging parts using dial indicators, digital indicators, and data acquisition software; calibration of instruments; part mastering.
25*	WMSSCOQ1-BX07XEN	Quality Systems	Quality system elements, definition of quality, ISO 9000 standard, types of quality management systems, PDCA cycle, continuous improvement concepts, audits, inspections.
26		Quality Improvement	Methods of process improvement, importance of data collection and analysis, types of statistical tools.
27*	WMSSCOQ1-BX08XEN	Introduction to SPC	Concepts of statistical process control, calculate mean, range, construct and analyze histograms, determine and interpret Cpk.
28*	WMSSCOQ1-BX09XEN	Control Charts	Types and applications of control charts; construct and analyze an X bar and R chart
29*	WMSSCOQ1-BX10XEN	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		Continuous Improvement - 2	Role of managers and production workers in quality, quality teams.
31		Inspections	Methods of quality inspection at different stages of manufacturing; document and communicate inspection.
32		Audits	Types of quality audits, Quality audit procedures, document quality audit results; develop an action plan and recommendation from a quality audit.
33		Prevention and Correction	Types of nonconformities and methods of detection; perform a root cause failure analysis; decide when / how to take preventive and corrective action.
34		Documentation	Perform an effectiveness check; document and report preventive and corrective actions.



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MSSC-M3: MANUFACTURING PROCESSES and PRODUCTION COURSE

Unit	Content	Subject	Description
35		Contacting the Customer	Interpretation of specifications, work orders, and technical drawings.
36		Designing Products	Identification of the major stages of production, production resources, and factors for production method selection.
37		Types of Production and Manufacturing Introduction	Identification of the characteristics and advantages of major types of production systems. Identification of different tools and their functions.
38*	WMSSCOP1-BX01XEN	Mechanical Principles	Six (6) types of simple machines, operation and application of levers, and concepts of force and weight.
39*	WMSSCOP1-BX02XEN	Mechanical Linkages	Effect of friction on machine operation; operation of machine linkages, cams, and turnbuckles.
40		Materials	Types, properties, and applications of materials and chemicals used to manufacture products, including food and beverage products.
41		Material Testing, Selection, and Development	Factors used to select materials for a given product, methods of testing material quality, and advances in material design.
42		Production Processes	Types, operation and application of casting, molding, machining, finishing, assembly, separation, conditioning, combining, and filling.
43*	WMSSCOP1-BX03XEN	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*	WMSSCOP1-BX04XEN	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*	WMSSCOP1-BX05XEN	Machine Operations	Use a drill press to perform basic drilling operations: reaming, counterboring, countersinking, and tapping.
46		Tools Usage	Types, applications and use of hand tools, portable power tools, and equipment.
47*	WMSSCOP1-BX06XEN	Equipment Procedures	Interpret standard operating procedures; read technical manuals to obtain information; Total Productive Maintenance; machine operation procedures.
48*	WMSSCOP1-BX07XEN	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		Components	Types of inventory and inventory management concepts; read a bill of material; identify cost of downtime and calculate product cost.
50*	WMSSCOP1-BX08XEN	Production Control	Operation of push and pull production systems, just-in-time production, methods of feedback to control quality.
51		Process Documentation	Types of production documents, methods of retaining documents, and use of electronic data exchange; read and handle production documents.
52		Packaging	Types and applications of product packaging; packaging regulations and laws; select packaging for given product; interpret package labels.
53		Distribution	Methods and applications of transporting produced products; interpret shipping documents; use a tracking system.

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MSSC-M4: MAINTENANCE AWARENESS COURSE

Unit	Content	Subject	Description
54*	WMSSCOM1-BX01XEN	Maintenance Awareness Introduction and Welding	Interpretation of specifications, work orders, and technical drawings.
55*	WMSSCOM1-BX02XEN	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*	WMSSCOM1-BX03XEN	Electrical Measurement	Basic concepts of electrical resistance, voltage, current, series circuits, parallel circuits; use of multimeter to measure electrical signals.
57*	WMSSCOM1-BX04XEN	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*	WMSSCOM1-BX05XEN	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*	WMSSCOM1-BX06XEN	Hydraulic Power Systems	Basic concepts of hydraulic power system operation with component identification, power unit operation, circuit connections, and basic cylinder circuits.
60*	WMSSCOM1-BX07XEN	Lubrication Concepts	Types, properties, and applications of grease and oil for lubrication; use of viscosimeter; use of grease gun; lubrication management, recycling.
61*	WMSSCOM1-BX08XEN	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*	WMSSCOM1-BX09XEN	Belt Drives	Types, operation, and application of belt drives; calculate speed and torque ratios; align a belt drive and adjust tension.
63*	WMSSCOM1-BX10XEN	Chain Drives	Types, operation, and application of chain drives; calculate speed and torque ratios; align a chain drive and adjust tension.
64*	WMSSCOM1-BX11XEN	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*	WMSSCOM1-BX12XEN	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.
66		High Vacuum Systems	Basic concepts of high vacuum systems.
67		Laser Systems	Basic concepts of laser systems.

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