INTRO TO MANUFACTURING

Code	Old Standard	Code	New Standard
IM1.0	Career exploration and development	IM1.0	Career exploration and development
IM1.1	Explore career pathways in manufacturing	IM1.1	Recognize the various career pathways/occupations that are available in manufacturing process/industry/business
		IM1.2	Design a career path for individual career interest in the manufacturing cluster
		IM6.1	Research and understand basic concepts of the manufacturing career pathways
			Plan, manage, and perform the processing of materials into intermediate or final products and understand related professional and technical support activities such as production planning and control, maintenance and
IM2.0	Explore the business process in manufacturing	IM2.0	manufacturing/process engineering
IM2.1	Develop a business process model for manufacturing operations	IM2.1	Develop a business plan for manufacturing operations
IM2.2	Analyze the manufacturing industry	IM6.0	Differentiate among a variety of manufacturing industries
IM2.3	Analyze trends and issues in the manufacturing industry	IM2.2	Explain trends and issues in the manufacturing industry
IM2.4	Explain how planning and budgeting are used to accomplish manufacturing goals and objectives		
IM2.5	Explain material control and product inventories necessary to meet customer and business requirements		
IM2.6	Explain how social and economic changes outside manufacturing impact the manufacturing process		
IM2.7	Explain the role of risk management in reducing risks and improving performance in manufacturing businesses		
IM2.8	Understand the roles and functions of government in regulating and supporting manufacturing business		
IM2.9	Develop a management plan for a manufacturing business	IM2.3	Demonstrate a management plan for the manufacturing process for the production of a product and/or business
IM2.10	Identify basic procedures in the accounting cycle		
IM3.0	Know manufacturing technology safety practices	IM3.0	Implement manufacturing technology safety practices
IM3.1	Maintain general safety in accordance with government regulations, health standards and company policy	IM3.1	Maintain general safety in accordance with government regulations, health standards, and company and/or school policy
IM3.2	Evaluate the ergonomic factors associated with the manufacturing industry	IM3.2	Evaluate ergonomic factors associated with the manufacturing industry
IM3.3	Identify state, federal and local worker safety, health and environmental regulations		
IM4.0	Understand health and environmental practices		
IM4.1	Identify practices that contribute to a healthy environment		
IM4.2	Handle hazardous materials in accordance with government regulations and health standards		
IM5.0	Understand basic tools and equipment used in the manufacturing	IM5.0	Utilize the appropriate tools and equipment used in the manufacturing industry
IM5.1	Identify basic tools and equipment appropriate to manufacturing	IM5.1	Use basic tools and equipment common to the manufacturing processes
IM6.0	Understand manufacturing technology basics		
IM6.1	Evaluate products in relation to size, proportion and tolerances	IM7.1	Differentiate products/components in relationship to size, proportion and tolerances
IM6.2	Interpret drawings, prints, and schematics		
IM6.3	Demonstrate basic drawing skills		
IM6.4	Describe basic electrical and electronic theory		
IM6.5	Describe basic hydraulic and pneumatic systems		
IM6.6	Describe fluid flow concepts		
IM6.7	Describe welding procedures for metals and plastics		
IM6.8	Describe materials joining procedures		
IM6.9	Identify machining procedures for metals and plastics		
IM6.10	Describe the application of basic mechanical physics		
IM6.11	Describe plastic processing and compounding		
IM6.12	Explain the impact of emerging technologies in manufacturing		
IM6.13	Describe basic metallurgy and metal processing		
IM7.0	Apply product development process	IM7.0	Design and create a product using engineering design loop
IM7.1	Develop identified product prototype	IM7.2	Develop a prototype of a product
IM7.2	Manufacture identified product	IM7.3	Test and evaluate a product
IM7.3	Present final product	IM7.4	Redesign product for final production
		IM4.0	Apply ethical practices in the workplace as they relate to today's society
		IM4.1	Identify and display professional practices in the workplace

MACHINE TOOL TECHNOLOGY

Code	Old Standard
MT1.0	Observe rules and regulations to comply with personal and shop safety
MT1.1	Show knowledge of shop operations and tool safety procedures tat meets OSHA standards
MT2.0	Apply various machining applications used in manufacturing
MT2.1	Apply concepts of mathematics, science and communications in machine tool technology
MT2.2	Demonstrate and test knowledge of blueprint reading, and material layout and fabrications
MT2.3	Demonstrate lathe and milling processes to meet industry standards
MT2.4	Identify proper terminology and career possibilities
MT3.0	Analyze computer aided software in machine tool applications used in industry
MT3.1	Identify computer aided software used in machine tool

Code	New Standard
MT1.0	Demonstrate knowledge of safety and essential academic concepts in Machine Tool
MT1.1	Explain and show knowledge of machine shop operation and tool safety procedures consistent with Occupational Safety and Health Administration (OSHA) standards
MT1.2	Introduce concepts of basic mathematics, blueprint reading, science, and communications used in machine tool processes
MT2.2	Demonstrate problem solving skills in basic lathe and milling setups and operations
MT2.1	Demonstrate knowledge of terminology, tools, methods of measurement, and material layout
MT1.3	Understand basic CNC programming and process
MT2.0	Show proper machine use and functions, utilizing problem solving skills to resolve machining issues
MT3.0	Apply proper ethical standards to machining skills and processes
MT3.1	Identify and demonstrate professional practices used in the machine shop
MT4.0	Explore careers in the manufacturing cluster
MT4.1	Identify machine tool related career pathways

ADVANCED MACHINE TOOL TECHNOLOGY

Code	Old Standard	Code	New Standard
***New Course**		AMT1.0	Demonstrate knowledge of safety and essential academic concepts in machine tool
		AMT1.1	Prove knowledge of shop operations and tool safety procedures consistent with Occupational Safety and Health Administration (OSHA) standards
		AMT1.2	Apply advanced concepts, including machine tool mathematics, blueprint reading, science, and communications to machine tool processes
		AMT1.3	Demonstrate and apply computer numerical control (CNC) programming concepts
		AMT2.0	Demonstrate ability through research, development, and implementation to create a project
		AMT2.1	Design, analyze and create various types of projects utilizing previous knowledge and skills to manufacture a single or assembled project
		AMT2.2	Evaluate and solve issues related to lathe and milling setups and operations
		AMT3.0	Demonstrate ethical practices and research career pathways
		AMT3.1	Identify and demonstrate professional practices used in the machine shop
		AMT3.2	Evaluate and describe career exploration activities to follow for a minimum of two different career pathways

WELDING TECHNOLOGY

Code	Olds Standard	Code	New Standards
IWT1.0	Identify and understand basic welding safety	WT1.0	Identify and understand welding safety
IWT1.1	Identify and demonstrate the proper industry safety standards	WT1.1	Identify and demonstrate proper industry safety standards
IWT2.0	Read, comprehend, and communicate written and spoken technical specification and instructions related to welding and welded assemblies	WT2.0	Read, comprehend, and communicate written and spoken technical terminology and instructions related to welding and welded assemblies
IWT2.1	Demonstrate mathematical skills related to work assignments	WT2.1	Demonstrate mathematical skills related to work assignments
IWT2.2	Read and demonstrate understanding of welding terms and definitions from ANSI/AWS A3.0 Standard Welding Terms and Definition	WT2.2	Read and demonstrate understanding of welding terms and definitions from American National Standards Institute (ANSI/American Welding Society (AWS)
IWT2.3	Complete a job assignment given verbal and written work assignments		
IWT3.0	Interpret drawings and welding symbol information	WT3.0	Interpret drawings and welding symbol information
IWT3.1	Read and sketch drawings	WT3.1	Read and sketch drawings
IWT3.2	Identify basic weld symbols	WT3.2	Identify basic weld symbols
IWT3.3	Identify lines and joints	WT3.3	Identify lines and joints
IWT4.0	Understand and perform oxyfuel cutting operations	WT4.0	Understand and perform metal cutting operations
IWT4.1	Identify and explain the use of oxyfuel cutting equipment	WT4.1	Identify and explain the use of oxyfuel and plasma cutting equipment
IWT4.2	Prepare layouts for cutting individual parts	WT4.2	Prepare layouts for cutting individual parts
IWT4.3	Perform cuts using oxyfuel gas-cutting process	WT4.3	Perform cuts using oxyfuel and plasma cutting processes
IWT4.4	Use weld-washing techniques		
IWT5.0	Exhibit knowledge and perform base metal prep	WT5.0	Exhibit knowledge and perform base metal preparation
IWT5.1	Prepare base metal for various welding processes	WT5.1	Prepare bae metal for various welding processes
IWT6.0	Understand and perform shielded metal arc welding (SMAW)	WT6.0	Understand and perform shielded metal arc welding (SMAW) process
IWT6.1	Identify and understand SMAW equipment and setup	WT6.1	Identify and understand SMAW equipment and setup
IWT6.2	Identify and understand Shielded Metal Arc electrodes	WT6.2	Define and understand the application for different Shielded Metal Arc (SMAW) electrodes
IWT6.3	Demonstrate knowledge of Shielded Metal Arc Welding (SMAW) process	WT6.3	Demonstrate knowledge of Shielded Metal Arc Welding (SMAW) process
IWT7.0	Demonstrate knowledge of weld quality	WT7.1	Demonstrate knowledge of weld quality
IWT7.1	Identify and demonstrate knowledge of quality control of the welding process	WT7.0	Identify and demonstrate knowledge of quality control of the welding process
IWT8.0	Student will participate in career exploration activities	WT8.0	Participate in career exploration activities
IWT8.1	Research career opportunities in the manufacturing fields	WT8.1	Research career opportunities in manufacturing/welding fields
		WT9.0	Practice ethical work behaviors
		WT9.1	Demonstrate ethical practices of the manufacturing industry

ADVANCED WELDING TECHNOLOGY

Code	Old Standard	Code	New Standard
AWT1.0	Identify and understand basic welding safety	AWT1.0	Identify and conform to basic welding safety standards
AWT1.1	Identify and demonstrate the proper industry safety standards	AWT1.1	Identify and practice the proper industry safety standards
AWT2.0	Interpret, layout and fabricate in conformance to construction and fabrication drawings	AWT2.0	Interpret, layout, and fabricate in conformance to fabrication drawings
AWT2.1	Correctly interprets dimensions and locations of components in construction and fabrication drawings	AWT2.1	Correctly interpret dimensions and locations of components in fabrication drawings
AWT2.2	Correctly scale dimensions in construction and fabrication drawings	AWT2.2	Correctly scale dimensions in fabrication drawings
AWT2.3	Correctly interprets orthographic views shown in construction and fabrication drawings	AWT2.3	Correctly interpret orthographic and pictorial plan view shown in fabrication drawings
AWT2.4	Recognize and correctly interpret lines and symbols commonly used in construction and fabrication drawings	AWT2.4	Recognize and correctly interpret lines and symbols commonly used in fabrication drawings
AWT3.0	Exhibit knowledge and perform base metal prep	AWT3.0	Exhibit knowledge and perform base metal preparation
AWT3.1	Prepare base meal for various welding processes	AWT3.1	Prepare base metal for various welding processes
AWT4.0	Understand and perform Gas Metal Arc Welding (GMAW) process	AWT4.0	Understand and perform Gas Metal Arc Welding (GMAW) process
AWT4.1	Identify and understand GMAW equipment and setup	AWT4.1	Identify and understand GMAW equipment and setup
AWT4.2	Demonstrate knowledge of Gas Metal Arc Welding (GMAW) process	AWT4.2	Demonstrate Gas Metal Arc Welding (GMAW) on steel
AWT5.0	Understand and perform Gas Tungsten Arc Welding (GTAW) process	AWT5.0	Understand and perform Gas Tungsten Arc Welding (GTAW) process
AWT5.1	Understand GTAW equipment and filler metals	AWT5.1	Understand GTAW equipment and filler metals
AWT5.2	Demonstrate knowledge of Gas Tungsten Arc Welding (GTAW) process	AWT5.2	Demonstrate Gas Tungsten Arc Welding (GTAW) process on steel
		AWT6.0	Understand and perform Shielded Metal Arc Welding (SMAW) process
		AWT6.1	Understand SMAW equipment and filler metals
		AWT6.2	Demonstrate knowledge of the Shielded Metal Arc Welding (SMAW) process
		AWT7.0	Understand and perform Carbon Arc cutting and gouging process
		AWT7.1	Understand carbon arc equipment
		AWT7.2	Demonstrate Carbon Arc cutting process
AWT6.0	Demonstrate knowledge of weld quality	AWT8.1	Demonstrate knowledge of weld quality
AWT6.1	Identify and demonstrate knowledge of quality control of the welding process	AWT8.0	Identify and demonstrate knowledge of quality control of the welding process including visual and destructive testing
AWT7.0	Student will participate in career exploration activities		
AWT7.1	Research career opportunities in the manufacturing fields	AWT9.0	Participate in career exploration activities
		AWT9.1	Research career opportunities in the welding pathways
		AWT10.0	Demonstrate ethical work behaviors
		AWT10.1	Demonstrate ethical work practices in the manufacturing industry

MECHANICAL DRAFTING

Code	Old Standard
MDD1.0	Demonstrate the use of geometric construction
MDD1.1	Apply geometric design and descriptive geometry to the design process
MDD1.2	Demonstrate basic geometric dimensioning and tolerancing
MDD2.0	Prepare mechanical drawings
MDD2.1	Create a multi view drawing
MDD2.2	Create sectional views of a mechanical drawing
MDD2.3	Develop auxiliary views of a mechanical drawing
MDD2.4	Generate pictorial drawing
MDD2.5	Examine drawing identification and management techniques used in mechanical drafting
MD3.0	Understand the manufacturing design process
MD3.1	Analyze different manufacturing processes
MDD3.2	Identify basic welding symbols used in manufacturing design process

Code	New Standard
MD1.0	Demonstrate the use of geometric construction
MD1.1	Apply geometric design and descriptive geometry to the design process
MD1.2	Demonstrate basic geometric dimensioning and tolerancing (GD&T)
MD2.0	Prepare mechanical drawings
MD2.1	Create a multi-view drawing
MD2.2	Create sectional views of a mechanical drawing
MD2.3	Develop auxiliary views of mechanical drawings
MD2.4	Generate pictorial drawings
MD2.5	Examine drawing identification and management techniques used in mechanical drafting
MD3.0	Understand the design for manufacturing and assembly
MD3.1	Analyze different manufacturing processes
MD3.2	Identify basic welding symbols used in manufacturing design
MD4.0	Explore careers in drafting fields
MD4.1	Define/compare career pathways in drafting