2019
Skills-to-Course Matrix

Manufacturing
Vernonia High School
Portland Community College
Jun-19

Manufacturing Cluster

CCTC*	Code Number	Cluster Knowledge and Skills (CTE standards) / KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
		Course Number	13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
		NCES Code	13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
		Credits	0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
		TSA	N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
MN 1	MN01	Evaluate the nature and scope of the Manufacturing Career Cluster™ and the role of manufacturing in society and in the economy.	x									
MN 2	MN02	Analyze and summarize how manufacturing businesses improve performance.				x						
MN 3	MN03	Comply with federal, state and local regulations to ensure worker safety and health and environmental work practices.	x	x	x	x						
MN 4	MN04	Describe career opportunities and means to achieve those opportunities in each of the Manufacturing Career Pathways.	x	x	x	x						
MN 5	MN05	Describe government policies and industry standards that apply to manufacturing.	x	x	x	x						

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Health, Safety & Environmental Assurances   Focus Area

CCTC*	Code Number	Focus Area Knowledge and Skills (CTE standards) — KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
			0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
			N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
MN-HSE 1	MNHS01	Demonstrate the safe use of manufacturing equipment.	x	x	x	x						
MN-HSE 2	MNHS02	Develop safety plans for production processes that meet health, safety and environmental standards.	x	x	x	x						
MN-HSE 3	MNHS03	Demonstrate a safety inspection process to assure a healthy and safe manufacturing environment.	x	x	x	x						
MN-HSE 4	MNHS04	Evaluate a system of health, safety and/or environmental programs, projects, policies or procedures to determine compliance.	x	x	x	x						
MN-HSE 5	MNHS05	Evaluate continuous improvement protocols and techniques in health, safety and/or environmental practices.				x						
MN-HSE 6	MNHS06	Conduct job safety and health analysis for manufacturing jobs, equipment and processes.	x	x	x	x						
MH-HSE 7	MNHS	Develop the components of a training program based on environmental health and safety regulations.										

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Logistics & Inventory Control Focus Area

CCTC*	Code Number	Focus Area Knowledge and Skills (CTE standards) / KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
			0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
		KS Statement	N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
MN-LOG 1	MNLG01	Demonstrate positive customer service skills in regard to logistics and inventory control issues.										
MN-LOG 2	MNLG02	Demonstrate proper handling of products and materials in a manufacturing facility.										
MN-LOG 3	MNLG03	Develop a safety inspection process to assure a healthy and safe manufacturing facility.										
MN-LOG 4	MNLG04	Manage inventory using logistics and control processes and procedures.										

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Machining & Metalforming Focus Area

CCTC*	Code Number	KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
			0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
	Focus Area Knowledge and Skills (CTE standards)		N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
	MNMF01	Perform skills necessary to operate metalforming equipment.				x						
	MNMF02	Handle materials used in metalforming operations.	x		x	x						
	MNMF03	Perform skills necessary in planning and controlling metalforming operations.			x							
	MNMF04	Perform bench operations related to machining.										
	MNMF05	Perform metal cutting operations on a lathe.										
	MNMF06	Perform metal cutting operations on a mill.			x							
	MNMF07	Perform metal cutting operations using contour sawing and electric discharge.	x	x	x	x						
	MNMF08	Perform metal cutting operations using a drill press.										
	MNMF09	Perform metal cutting operations using grinding equipment.	x	x	x	x						
	MNMF10	Perform inspection and quality assurance procedures in machining.	x	x	x	x						
	MNMF11	Understand properties of materials and their relationship to machining processes.	x	x	x	x						

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Maintenance, Installation & Repair Focus Area

CCTC*	Code Number	KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
		Focus Area Knowledge and Skills (CTE standards)	0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
			N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
MN-MIR 1	MNMR01	Demonstrate maintenance skills and proficient operation of equipment to maximize manufacturing performance.										
MIN-MIR 2	MNMR02	Demonstrate the safe use of manufacturing equipment to ensure a safe and healthy environment.										
MN-MIR 3	MNMR03	Diagnose equipment problems and effectively repair manufacturing equipment.										
MN-MIR 4	MNMR04	Investigate and employ techniques to maximize manufacturing equipment performance.										
MN-MIR 5	MNMR05	Implement a preventative maintenance schedule to maintain manufacturing equipment, tools and workstations.										
MN-MIR 6	MNMR06	Implement an effective, predictive and preventive manufacturing equipment maintenance program.										

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Manufacturing Production Process Development

Focus Area

CCTC*	Code Number	Focus Area Knowledge and Skills (CTE standards) / KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
			0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
			N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
MN-PPD 1	MNXA01	Produce quality products that meet manufacturing standards and exceed customer satisfaction.				x						
MN-PPD 2	MNXA02	Research, design and implement alternative manufacturing processes to manage production of new and/or improved products.			x							
MN-PPD 3	MNXA03	Monitor, promote and maintain a safe and productive workplace using techniques and solutions that ensure safe production of products.	x	x	x	x						
MN-PPD 4	MNXA04	Implement continuous improvement processes in order to maintain quality within manufacturing production.										
MN-PPD 5	MNXA05	Develop procedures to create products that meet customer needs.	x	x	x	x						

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Mechanical CAD/Drafting Focus Area

CCTC*	Code Number	Focus Area Knowledge and Skills (CTE standards) KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
			0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
			N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
	MNPJ01	Apply measurement and scale concepts in drafting and design.			x							
	MNPJ02	Interpret engineering documents and control documents.										
	MNPJ03	Create technical sketches using drafting procedures.			x							
	MNPJ04	Use a CADD system and procedures.			x							
	MNPJ05	Detail projection views/components.	x	x	x	x						
	MNPJ06	Explore mechanical drafting/design concepts and problems.	x		x							
	MNPJ07	Demonstrate drafting/design concepts as related to basic manufacturing processes.	x	x	x	x						
	MNPJ08	Incorporate geometric dimensioning and tolerancing (GDT) standards.	x	x	x	x						
	MNPJ09	Depict assemblies of components.	x		x							

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Production Focus Area

Instructions: 1) Enter the Program of Study name above. 2) Enter your high school name. 3) Enter the community college name. 4) Enter the date. 5) Click on the cell for Course 1 Name, Course 2 Name, etc., and replace with your POS course names--secondary and first year of post-secondary. 6) Enter school course numbers. 7) Enter NCES code for the course (secondary only). 8) Enter number of credits awarded. 9) Identify those courses that trigger the TSA for this POS. 10) Finally, check those standards that are <u>taught with intent and purpose</u>, and are <u>assessed</u> in each course. Note: The optional Focus Area tabs below are included for those POSs that have a very specific industry fociusare using those skill sets for multiple options in a Progam of Study or if you want to use another set of industry validated standards.

CCTC*	Code Number	KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
	Focus Area Knowledge and Skills (CTE standards)		0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
			N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
MN-PRO 1	MNPR01	Diagnose production process problems and take corrective action to meet production quality standards.	x	x	x	x						
MN-PRO 2	MNPR02	Manage safe and healthy production working conditions and environmental risks.	x	x	x	x						
MN-PRO 3	MNPR03	Make continuous improvement recommendations based on results of production process audits and inspections.										
MN-PRO 4	MNPR04	Coordinate work teams when producing products to enhance production process and performance.										
MN-PRO 5	MNPR05	Demonstrate the safe use of manufacturing equipment.	x	x	x	x						

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Quality Assurance Focus Area

CCTC*	Code Number	KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
			0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
		Focus Area Knowledge and Skills (CTE standards)	N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
MN-QA 1	MNQA01	Evaluate production operations for product and process quality.	x	x	x	x						
MN-QA 2	MNQA02	Recommend and implement continuous improvement in manufacturing processes.										
MN-QA 3	MNQA03	Coordinate work teams to create a product that meets quality assurance standards.		x		x						
MN-QA 4	MNQA04	Employ project management processes using data and tools to deliver quality, value-added products.										
MN-QA 5	MNQA05	Perform safety inspections and training to ensure a safe and healthy workplace.										
MN-QA 6	MNQA06	Implement continuous improvement processes to maintain quality products.										
MN-QA 7	MNQA07	Identify inspection processes that ensure products meet quality specifications.		x								

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Skills-to-Course Matrix

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Secondary Wood Products Focus Area

Instructions: 1) Enter the Program of Study name above. 2) Enter your high school name. 3) Enter the community college name. 4) Enter the date. 5) Click on the cell for Course 1 Name, Course 2 Name, etc., and replace with your POS course names--secondary and first year of post-secondary. 6) Enter school course numbers. 7) Enter NCES code for the course (secondary only). 8) Enter number of credits awarded. 9) Identify those courses that trigger the TSA for this POS. 10) Finally, check those standards that are <u>taught with intent and purpose</u>, and are <u>assessed</u> in each course. Note: The optional Focus Area tabs below are included for those POSs that have a very specific industry fociusare using those skill sets for multiple options in a Progam of Study or if you want to use another set of industry validated standards.

			Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	Course Number	Course Number	urse Num	urse Num	urse Num	urse Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	ICES Cod	ICES Cod	ICES Cod	ICES Code]
Focus Area Knowledge and Skills (CTE standards)			0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	of Credit	of Credit	of Credit	of Credits]
CCTC*	Code Number	KS Statement	N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	SA--Y or N	SA--Y or N	SA--Y or N	SA--Y or N?]
	MNWP01	Understand manufacturing processes related to secondary wood products.										
	MNWP02	Understand characteristics and properties of materials used in manufacturing secondary wood products.										
	MNWP03	Use appropriate techniques in manufacturing of secondary wood products.										

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Welding Focus Area

CCTC*	Code Number	KS Statement	Introduction to Manufacturing	Intro to MIG and TIG	Intro to CNC	Fabrication I	[Course 5 Name]	[Course 6 Name]	[Course 7 Name]	[Course 8 Name]	[Course 9 Name]	[Course 10 Name]
			13202	13207	13249	13208	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]	[Course Number]
			13202	13207	13249	13208	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]	[NCES Code]
			0.5	0.5	0.5	0.5	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]	[# of Credits]
		Focus Area Knowledge and Skills (CTE standards)	N	N	N	Y	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]	[TSA--Y or N?]
	MNWL01	Perform safety, health, inspection, and repair processes related to welding and thermal cutting.	x	x	x	x						
	MNWL02	Perform entry level welding processes using a variety of welding technologies including shielded metal arc welding (SMAW), gas metal arc welding (GMAW), flux cored arc welding (FCAW), and gas tungsten welding (GTAW).	x	x								
	MNWL03	Perform thermal cutting process using a variety technologies including manual oxyfuel gas cutting (OFC), mechanized oxyfuel gas cutting (track burner), plasma arc cutting (PAC), and air carbon arc cutting (CAC-A).			x	x						
	MNWL04	Interpret drawing and welding symbols.	x	x	x	x						
	MNWL05	Perform advanced level welding processes using a variety of welding technologies including shielded metal arc welding (SMAW), gas metal arc welding (GMAW), flux cored arc welding (FCAW), and gas tungsten welding (GTAW).		x	x	x						
	MNWL06	Perform operations related to shop equipment used in welding, layout, and part preparation.	x									
	MNWL07	Understand basic welding metallurgy.	x									