Tualatin High School
Portland Community College
Advanced Manufacturing
6/28/2016

## **Manufacturing Cluster**

#### **Skills-to-Course Matrix**

#### **Cluster** Knowledge and Skills (CTE standards)

Code Number	KS Statement	
MNZ01.01	Use mathematics in the manufacturing process.	J
MNZ01.02	Understand the application of the principles of science used in manufacturing.	J
MNZ05.01	Summarize and explain how manufacturing businesses operate to demonstrate an understanding of key functions within organizations in the industry.	
MNZ05.02	Analyze and summarize how manufacturing businesses improve performance to demonstrate an understanding of various methods for enhancing production.	
MNZ06.01	Maintain safe and healthful working conditions and environment to ensure employee safety.	J
MNZ06.02	Understand employee rights and responsibilities and employers obligations concerning occupational safety and health.	
MNZ06.03	Assess types and sources of workplace hazards in order to maintain safe working conditions in a manufacturing business environment.	
MNZ06.04	Control workplace hazards in order to maintain safe working conditions in a manufacturing business environment.	
MNZ08.01	Summarize safety, health, and environmental management systems to build an understanding of compliance with governmental policies and procedures for manufacturing businesses.	
MNZ10.01	Describe and employ technical skills and knowledge required for careers in manufacturing in order to perform basic workplace activities common to manufacturing.	

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;	standards tha	t are taught with int se skill sets for multi	tent and purpose in eac ple options in a Progan	ch course. (You only n of Study or if you w	need to use the option	onal Focus Area tabs if et of industry validated	
L	standards.)	TSA <sup>2</sup> Computer Aided	TSA RechGeometry	75A³ □ Robotics	rsa <sup>?</sup> Designan	TSA Designatu	TSA? Rayanced Project
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# Health, Safety & Environmental Assurance Focus Area

#### **Skills-to-Course Matrix**

<u> </u>	Focus Area Knowledge and Skills (CTE standards)	course 1	rsa course 2	rsa. □ Course 3	15A Course A	TSA COURSES	TSA. Course 6	75A. □
Code Number	KS Statement							
MNPF01.01	Ensure that equipment is used safely in the workplace.							
MNPF02.01	Plan for safety in new production processes.							
MNPF03.01	Conduct health, safety and/or environmental incident and hazard investigations.							
MNPF04.01	Conduct preventive health, safety and/or environmental incident and hazard inspections.							
MNPF05.01	Implement health, safety, and/or environmental programs, projects, policies or procedures.							
MNPF06.01	Implement continuous improvement in health, safety and/or environmental practices.							
MNPF07.01	Promote health, safety and/or environmental assurance programs.							
MNPF08.01	Conduct job safety and health analysis for jobs, equipment and processes.							
MNPF09.01	Maintain a safe and productive workplace.							
MNPF10.01	Train workers in health, safety and/or environmental issues.							

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## **Industrial & Engineering Systems Focus Area**

### **Skills-to-Course Matrix**

<u> </u>	Focus Area Knowledge and Skills (CTE standards)	course 1	TSA COUISE 2	TSA Course 3	TSA COURSE A	TSA COUSES	75A. Contee 6	<b>√</b> ≥8. □
Code Number	KS Statement							
MNPH10.01	Perform skills necessary to operate metalforming equipment.							
MNPH10.02	Handle materials used in metalforming operations.							
MNPH10.03	Perform skills necessary in planning and controlling metalforming operations.							
MNPH10.04	Perform bench operations related to machining.							
MNPH10.05	Perform metal cutting operations on a lathe.							
MNPH10.06	Perform metal cutting operations on a mill.							
MNPH10.07	Perform metal cutting operations using contour sawing and electric discharge.							
MNPH10.08	Perform metal cutting operations using a drill press.							
MNPH10.09	Perform metal cutting operations using grinding equipment.							
MNPH10.10	Perform inspection and quality assurance procedures in machining.							
MNPH10.11	Understand properties of materials and their relationship to machining processes.							
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# Manufacturing Production Process Development Focus Area

#### **Skills-to-Course Matrix**

	Focus Area Knowledge and Skills (CTE standards)	Course 2	TSA COURSE 2	TSA. Conse 3	15A Course A	tsa course's	15A. Contse 6	<b>√</b> 8α. □
Code Numbe	r KS Statement							
MNPA02.01	Communicate with others to ensure that the manufacturing production process meets requirements.							
MNPA06.01	Monitor, promote and maintain a safe and productive workplace using a variety of techniques and solutions to ensure safe production of products.							
MNPA10.01	Produce a product that demonstrates the relationship between production processes and meeting customer needs.							
MNPA10.02	Implement manufacturing processes to manage production of new and/or improved products.							
MNPA10.03	Implement continuous improvement processes in order to maintain quality within the manufacturing production process.							
MNPA10.04	Recommend and/or implement continuous improvement activities in order to ensure production of high quality products that meet customer expectations.							
MNPA10.05	Produce a product to demonstrate use of manufacturing production process development strategies and techniques.							
MNPA10.06	Improve production processes in order to achieve manufacturing goals and meet customer and product standards.							
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Date:

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## **Mechanical CAD/Drafting Focus Area**

#### **Skills-to-Course Matrix**

Ē	Focus Area Knowledge and Skills (CTE standards)	course 1	75A Course 2	TSA° COUISE 3	TSA. Contse a	tsa. Contee s	TSA. Contee 6	
Code Number	KS Statement							
MNPJ10.01	Apply measurement and scale concepts in drafting and design.							
MNPJ10.02	Interpret engineering documents and control documents.							
MNPJ10.03	Create technical sketches using drafting procedures.							
MNPJ10.04	Use a CADD system and procedures.							
MNPJ10.05	Detail projection views/components.							
MNPJ10.06	Explore mechanical drafting/design concepts and problems.							
MNPJ10.07	Demonstrate drafting/design concepts as related to basic manufacturing processes.							
MNPJ10.08	Incorporate geometric dimensioning and tolerancing (GDT) standards.							
MNPJ10.09	Depict assemblies of components.							

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## **Secondary Wood Products Focus Area**

#### **Skills-to-Course Matrix**

	Focus Area Knowledge and Skills (CTE standards)	course 1	rsa <sup>2</sup>	TSA?	TSA? □ COUISE A	rsa <sup>?</sup> □ course s	TSA? COUTSE 6	<b>1</b> 58 <sup>3</sup> .
Code Numbe	r KS Statement	_ □						
MNPI10.01	Understand manufacturing processes related to secondary wood products.							
MNPI10.02	Understand characteristics and properties of materials used in manufacturing secondary wood products.							
MNPI10.03	Use appropriate techniques in manufacturing of secondary wood products.							

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## **Welding Focus Area**

### **Skills-to-Course Matrix**

<u> </u>	ocus Area Knowledge and Skills (CTE standards)	Course 1	TSA? □ COUISE?	75A³ □ Course³	rsa? □ coursea	rsa? □ course s	TSA? □ COUISE 6	<sub>√SA</sub> ?.
Code Number	KS Statement							
MNPG06.01	Perform safety, health, inspection, and repair processes related to welding and thermal cutting.							
MNPG10.01	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).							
MNPG10.02	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).							
MNPG10.03	Interpret drawing and welding symbols.							
MNPG10.04	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).							
MNPG10.05	Perform operations related to shop equipment used in welding, layout, and part preparation.							
MNPG10.06	Understand basic welding metallurgy.							