High School Name:
Community College Name: Portland Community College
CTE Program of Study Name: Engineering
Date: 12/1/2016

Engineering Technology Cluster

2016

Skills-to-Course Matrix

Instructions: 1) Enter your high school name above. 2) Enter the community college name. 3) Enter the Program of Study name. 4) Enter the date. 5) Click on Course 1, Course 2, etc. below and replace with your POS course names (or numbers). 6) Check those courses that trigger the TSA for this POS. 7) Finally, check those standards that are taught with intent and purpose, and are assessed in each course. Note: You only need to use the optional Focus Area tabs below if you are using those skill sets for multiple options in a Progam of Study or if you want to use another set of industry validated standards.

Cluster Knowledge and Skills (CTE standards)

CCTC	Code Number	KS Statement	CMET 110 Yes	CMET 111 TSA?	CMET 112 TSA?	ENGR 102 TSA?	CMET 121 TSA?	CMET 122 TSA?	CMET 123 TSA?	CMET 131 TSA?	CMET 213 TSA?	CMET 227 TSA?	CH 101 TSA?	CMET 133 TSA?	CMET 223 TSA?	COMM 111 TSA?	ENGR 226 TSA?	CMET 241 TSA?	CMET 233 TSA?	CMET 237 TSA?	CMET 254 TSA?	CMET 235 TSA?	CMET 221 TSA?	CMET 211 TSA?
	EN01	Use effective communication skills with a variety of audiences.	x	x	x	x	x	x	x	x	x	x												
	EN02	Exhibit integrity and professionalism in engineering cluster occupations.																						
	EN03	Use technology such as computers and design software to solve engineering problems.							x			x	x	x	x			x	x	x				
	EN04	Understand and use applied mathematics and science for engineering cluster careers.	x	x	x	x	x	x	x	x	x	x												
	EN05	Develop and implement a career plan within the engineering cluster occupations.														x					x			
	EN06	Use teamwork, critical thinking and problem solving skills to address complex problems in engineering.	x	x	x	x	x	x	x	x	x	x												
	EN07	Understand the role of engineering in society throughout history and how it is affected by economics, regulations, politics, and corporate culture.																						
	EN08	Apply design principles and life-cycle methodology to create products, systems, and processes using appropriate technology.															x					x		
	EN09	Understand the impact personal characteristics, such as creativity, resourcefulness, the ability to visualize and the ability to think abstractly have on engineers and their ability to design.	x	x	x	x	x	x	x	x	x	x												
	EN10	Understand and adhere to safety, health, and environmental standards and regulations.															x					x	x	x

High School Name:

Community College Name: Portland Community College

CTE Program of Study Name: Engineering

Date: 12/1/2016

Chemical Focus Area

2016

Skills-to-Course Matrix

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Focus Area Knowledge and Skills (CTE standards)

CCTC	Code Number	KS Statement	CMET 110	CMET 111	CMET 112	ENGR 102	CMET 121	CMET 122	CMET 123	CMET 131	CMET 213	CMET 227	CH 101	CMET 133	CMET 223	COMM 111	ENGR 226
			TSA?	TSA?	TSA?	TSA?	TSA?	TSA?									
	ENCS01	Understand the laws of thermodynamics and their application in the analysis of chemical engineering problems.															
	ENCS02	Understand and apply knowledge of chemistry in the solving of chemical engineering problems.															
	ENCS03	Understanding of chemical engineering processes.															

High School Name:
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Date: 12/1/2016

Civil & Infrastructure Systems Focus Area

2016

Skills-to-Course Matrix

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Focus Area Knowledge and Skills (CTE standards)

CCTC	Code Number	KS Statement	CMET 110	CMET 111	CMET 112	ENGR 102	CMET 121	CMET 122	CMET 123	CMET 131	CMET 213	CMET 227	CH 101	CMET 133	CMET 223	COMM 111	ENGR 226	CMET 228	CMET 211	CMET 214
	ENCV01	Understand and use material science to solve problems appropriate to civil engineering.									x			x				x		
	ENCV02	Demonstrate knowledge of fluid dynamics.																		
	ENCV03	Demonstrate knowledge of structural dynamics.																		
	ENCV04	Understand and apply basic principles of environment quality.																	x	
	ENCV05	Understand and apply knowledge of soil structure and mechanics to solve problems in civil engineering.																x		
	ENCV06	Understand and use local, regional, national and global spatial data infrastructures.															x			x
	ENCV07	Understand and apply the principles of surveying in civil engineering.															x			x

High School Name:

Community College Name: Portland Community College

CTE Program of Study Name: Engineering

Date: 12/1/2016

Electrical Systems Focus Area

2016

Skills-to-Course Matrix

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Focus Area Knowledge and Skills (CTE standards)			CMET 110	CMET 111	CMET 112	ENGR 102	CMET 121	CMET 122	CMET 123	CMET 131	CMET 213	CMET 227	CH 101	CMET 133	CMET 223	COMM 111	ENGR 226	CMET 227
CCTC	**Code Number**	**KS Statement**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**										x
	ENES01	Understand and apply electrical theory and laws.																x
	ENES02	Demonstrate knowledge and application of transistors.																x
	ENES03	Understand and apply circuit concepts and analysis techniques.																x
	ENES04	Demonstrate knowledge of circuit design and fabrication.																
	ENES05	Understand and apply digital concepts and circuitry.																
	ENES06	Demonstrate knowledge of power sources and power supplies.																
	ENES07	Demonstrate knowledge of communication systems.																
	ENES08	Understand and perform skills for system integration and amplification.																
	ENES09	Communicate using symbols, measurements, conventions, icons, and graphic images.																

High School Name:
Community College Name: Portland Community College
CTE Program of Study Name: Engineering
Date: 12/1/2016

Manufacturing Systems Focus Area

2016

Skills-to-Course Matrix

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Focus Area Knowledge and Skills (CTE standards)

CCTC	Code Number	KS Statement	CMET 110 TSA?	CMET 111 TSA?	CMET 112 TSA?	ENGR 102 TSA?	CMET 121 TSA?	CMET 122 TSA?	CMET 123	CMET 131	CMET 213	CMET 227	CH 101	CMET 133	CMET 223	COMM 111	ENGR 226	CMET 235	ENGR 262
	ENMN01	Use knowledge of material science to solve problems appropriate to manufacturing engineering.												x					
	ENMN02	Demonstrate knowledge of planning and logistics requirement in manufacturing engineering.																x	
	ENMN03	Demonstrate an understanding of quality control.																x	x
	ENMN04	Understand and apply basics of supply chain management.																x	
	ENMN05	Understand and apply knowledge of manufacturing processes and practices.																x	x
	ENMN06	Demonstrate basic knowledge of packaging within manufacturing.																	

High School Name:
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CTE Program of Study Name: Engineering
Date: 12/1/2016

Mechanical Systems Focus Area

2016

Skills-to-Course Matrix

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Focus Area Knowledge and Skills (CTE standards)			CMET 110	CMET 111	CMET 112	ENGR 102	CMET 121	CMET 122	CMET 123	CMET 131	CMET 213	CMET 227	CH 101	CMET 133	CMET 223	COMM 111	ENGR 226	ENGR 262	ENGR 212	ENGR 222	CMET 226
CCTC	**Code Number**	**KS Statement**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**	**TSA?**				
	ENMS01	Understand and use principles of machine theory.																x			
	ENMS02	Demonstrate knowledge of fluid dynamics.									x										
	ENMS03	Demonstrate knowledge of statics and dynamics in mechanical systems.	x																		x
	ENMS04	Use knowledge of material science to solve problems appropriate to manufacturing engineering.												x							
	ENMS05	Demonstrate knowledge of thermal dynamics.																	x	x	