# 2019

## Skills-to-Course Matrix

**Microelectronics**
**[High School Name]**
**Portland Community College**
**Mar-19**

## Engineering Technology Cluster

**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.

| | | | Everyday Chemistry with Lab | Introduction to Semiconductor Manufac... | Introduction to Semiconductor Devices | Introduction to Soar Voltaic Processing | Intro to Electronics and Instrumentatio... | Digital Systems I | High Tech Employment Strategies | [Course 8 Name] | [Course 9 Name] | [Course 10 Name] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CH 100 | MT 101 | MT 102 | MT 104 | MT 109 | MT 121 | MT 180 | [Course Number] | [Course Number] | [Course Number] |
| | | | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] |
| | | | 4 | 1 | 1 | 1 | 3 | 3 | 1 | [# of Credits] | [# of Credits] | [# of Credits] |
| **CCTC\*** | **Code Number** | **Cluster Knowledge and Skills (CTE standards)** <br> KS Statement | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] |
| | 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 | | | | | |
| | ENMS04 | Use knowledge of material science to solve problems appropriate to manufacturing engineering. | | | | | | | | | | |
| | ENMS05 | Demonstrate knowledge of thermal dynamics. | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CH 100 | MT 101 | MT 102 | MT 104 | MT 109 | MT 121 | MT 180 | [Course Number] | [Course Number] | [Course Number] |
| | | | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] |
| | | | 4 | 1 | 1 | 1 | 3 | 3 | 1 | [# of Credits] | [# of Credits] | [# of Credits] |
| **Cluster Knowledge and Skills (CTE standards)** | | | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] |
| | EN01 | Use effective communication skills with a variety of audiences. | x | x | x | x | x | x | x | | | |
| | EN02 | Exhibit integrity and professionalism in engineering cluster occupations. | | | x | x | | | x | | | |
| | EN03 | Use technology such as computers and design software to solve engineering problems. | | | | | x | x | | | | |
| | EN04 | Understand and use applied mathematics and science for engineering cluster careers. | | | | | | | | | | |
| | EN05 | Develop and implement a career plan within the engineering cluster occupations. | | | | | | | x | | | |
| | EN06 | Use teamwork, critical thinking and problem solving skills to address complex problems in engineering. | | | | | | x | | | | |
| | EN07 | Understand the role of engineering in society throughout history and how it is affected by economics, regulations, politics, and corporate culture. | | | | | | | x | | | |
| | EN08 | Apply design principles and life-cycle methodology to create products, systems, and processes using appropriate technology. | | | | | | 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. | | | | | | | | | | |
| | EN10 | Understand and adhere to safety, health, and environmental standards and regulations. | | x | | | x | x | x | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CH 100 | MT 101 | MT 102 | MT 104 | MT 109 | MT 121 | MT 180 | [Course Number] | [Course Number] | [Course Number] |
| | | | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] |
| | **Cluster** Knowledge and Skills (CTE standards) | | 4 | 1 | 1 | 1 | 3 | 3 | 1 | [# of Credits] | [# of Credits] | [# of Credits] |
| CCTC* | Code Number | KS Statement | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] |
| | 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. | X | | | | | | | | | |

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### Engineering Technology Cluster

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CH 100 | MT 101 | MT 102 | MT 104 | MT 109 | MT 121 | MT 180 | [Course Number] | [Course Number] | [Course Number] |
| | | | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] |
| | | | 4 | 1 | 1 | 1 | 3 | 3 | 1 | [# of Credits] | [# of Credits] | [# of Credits] |
| **Cluster Knowledge and Skills (CTE standards)** | | | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] |
| | ENCV01 | Understand and use material science to solve problems appropriate to civil engineering. | | | | | | | | | | |
| | ENCV02 | Demonstrate knowledge of fluid dynamics. | | | | | | | | | | |
| | ENCV03 | Demonstrate knowledge of structural dynamics. | | | | | | | | | | |
| | ENCV04 | Understand and apply basic principles of environment quality. | | | | | | | | | | |
| | ENCV05 | Understand and apply knowledge of soil structure and mechanics to solve problems in civil engineering. | | | | | | | | | | |
| | ENCV06 | Understand and use local, regional, national and global spatial data infrastructures. | | | | | | | | | | |
| | ENCV07 | Understand and apply the principles of surveying in civil engineering. | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ENES01 | Understand and apply electrical theory and laws. | | | | | | | | | | |
| | ENES02 | Demonstrate knowledge and application of transistors. | | x | x | x | x | x | | | | |
| | ENES03 | Understand and apply circuit concepts and analysis techniques. | | | | | x | x | | | | |
| | ENES04 | Demonstrate knowledge of circuit design and fabrication. | | x | x | x | x | x | | | | |
| | ENES05 | Understand and apply digital concepts and circuitry. | | | | | x | x | | | | |
| | 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. | | | | | | x | | | | |
| | ENES09 | Communicate using symbols, measurements, conventions, icons, and graphic images. | | x | x | x | x | x | | | | |

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

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| | | | CH 100 | MT 101 | MT 102 | MT 104 | MT 109 | MT 121 | MT 180 | [Course Number] | [Course Number] | [Course Number] |
| | | | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] | [NCES Code] |
| | | | 4 | 1 | 1 | 1 | 3 | 3 | 1 | [# of Credits] | [# of Credits] | [# of Credits] |
| **CCTC\*** | **Code Number** | **KS Statement** | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] | [TSA--Y or N?] |
| | ENMN01 | Use knowledge of material science to solve problems appropriate to manufacturing engineering. | | | x | x | x | x | | | | |
| | ENMN02 | Demonstrate knowledge of  planning and logistics requirement in manufacturing engineering. | | | | | x | x | | | | |
| | ENMN03 | Demonstrate an understanding of quality control. | | | | | | x | | | | |
| | ENMN04 | Understand and apply basics of supply chain management. | | | | | | | | | | |
| | ENMN05 | Understand and apply knowledge of manufacturing processes and practices. | | | | | x | | | | | |
| | ENMN06 | Demonstrate basic knowledge of packaging within manufacturing. | | | | | | | | | | |

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