

High School Name:
 Community College Name:
 CTE Program of Study Name:
 Date:

Liberty High School
 Portland Community College
 Sustainable Design
 6/1/2018

Architecture & Construction 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 Program 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 | Construction Technology | Sustainable Design 1 | Sustainable Design 2 | Course 4 | Course 5 | Course 6 |
|------|-------------|--|-------------------------|----------------------|----------------------|----------|----------|----------|
| | | | TSA? | TSA? | Yes | TSA? | TSA? | TSA? |
| AC 1 | AC01 | Use vocabulary, symbols, and formulas commonly used in design and construction. | X | X | X | | | |
| AC 2 | AC02 | Use architecture and construction skills to create and manage a project. | | X | X | | | |
| AC 3 | AC03 | Comply with regulations and applicable codes to establish and manage a legal and safe workplace/jobsite. | X | X | X | | | |
| AC 4 | AC04 | Understand the nature and scope of the Architecture & Construction Career Cluster™ and the role architecture and construction play in society and the economy. | X | X | X | | | |
| AC 5 | AC05 | Understand the roles and responsibilities among trades and professions, including labor/management relationships. | | | X | | | |
| AC 6 | AC06 | Read, interpret, and use technical drawings, documents, and specifications to plan a project. | | X | X | | | |
| AC 7 | AC07 | Evaluate a wide range of career pathway opportunities for success in architecture and construction careers. | X | X | X | | | |

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Construction Management Focus Area

2016

Skills-to-Course Matrix

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Focus Area Knowledge and Skills (CTE standards)

| CCTC | Code Number | KS Statement | <i>Course 1</i> TSA? | <i>Course 2</i> TSA? | <i>Course 3</i> TSA? | <i>Course 4</i> TSA? | <i>Course 5</i> TSA? | <i>Course 6</i> TSA? |
|----------|-------------|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| AC-CST 1 | ACCS01 | Understand contractual relationships with all parties involved in the building process to ensure successful build of a project. | | | | | | |
| AC-CST 2 | ACCS02 | Understand approval procedures to ensure effective flow of information in the construction process. | | | | | | |
| AC-CST 3 | ACCS03 | Understand and implement testing and inspection procedures to ensure successful completion of a construction project. | | | | | | |
| AC-CST 4 | ACCS04 | Understand the purpose of scheduling as it relates to the successful completion of a construction project. | | | | | | |
| AC-CST 5 | ACCS05 | Understand and apply practices and procedures required to maintain jobsite safety. | | | | | | |
| AC-CST 6 | ACCS06 | Manage relationships with internal and external parties to successfully complete construction projects. | | | | | | |
| AC-CST 7 | ACCS07 | Compare and contrast the building systems and components for a given project. | | | | | | |
| AC-CST 8 | ACCS08 | Demonstrate the construction crafts required for each phase of a given project. | | | | | | |
| AC-CST 9 | ACCS09 | Safely use and maintain appropriate tools, machinery, equipment, and resources to accomplish construction project goals. | | | | | | |

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Design & Pre-Construction Focus Area

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Focus Area Knowledge and Skills (CTE standards)

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| | | | TSA? | TSA? | Yes | TSA? | TSA? | TSA? |
| AC-DES 1 | ACDP01 | Justify design solutions through the use of research documentation and analysis of data. | | | X | | | |
| AC-DES 2 | ACDP02 | Use effective communication skills and strategies (listening, speaking, reading, writing, and graphic communications) to work with clients and colleagues. | X | X | X | | | |
| AC-DES 3 | ACDP03 | Understand the integral systems that impact the design of buildings and structures. | | X | X | | | |
| AC-DES 4 | ACDP04 | Apply building codes, laws, and rules in the design and construction of projects. | | | X | | | |
| AC-DES 5 | ACDP05 | Identify the diversity of needs, values, and social patterns in project design, including accessibility standards, to appropriately meet client needs. | | X | X | | | |
| AC-DES 6 | ACDP06 | Apply the techniques and skills of modern drafting, design, engineering, and construction to projects. | X | X | X | | | |
| AC-DES 7 | ACDP07 | Employ appropriate representational media to communicate concepts and design. | X | X | X | | | |
| AC-DES 8 | ACDP08 | Apply principles, conventions, standards, applications, and restrictions pertaining to the selection and use of construction materials, components, and assemblies for project design. | | X | X | | | |

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Low Voltage Electrical Focus Area

2016

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Focus Area Knowledge and Skills (CTE standards)

| CCTC | Code Number | KS Statement | Construction Technology | Sustainable Design 1 | Sustainable Design 2 | Course 4 | Course 5 | Course 6 |
|------|-------------|---|-------------------------|----------------------|----------------------|----------|----------|----------|
| | | | TSA? | TSA? | Yes | TSA? | TSA? | TSA? |
| | ACLV01 | Install pathways and spaces for low-voltage electrical systems. | | | | | | |
| | ACLV02 | Prepare and install low-voltage cabling. | | | | | | |
| | ACLV03 | Understand semiconductors and integrated circuits. | | X | X | | | |
| | ACLV04 | Use test equipment. | | X | X | | | |
| | ACLV05 | Understand power quality and grounding. | | X | X | | | |
| | ACLV06 | Understand switching devices and timers. | | | X | | | |
| | ACLV07 | Prepare wire and cable terminations. | | | | | | |
| | ACLV08 | Understand codes and standards related to low-voltage electrical. | | | | | | |
| | ACLV09 | Use computer applications in low-voltage electrical systems. | | | X | | | |
| | ACLV10 | Conduct maintenance and repair on low-voltage electrical systems. | | | | | | |
| | ACLV11 | Install rack systems for electronic equipment. | | | | | | |

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Maintenance & Operations Focus Area

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Focus Area Knowledge and Skills (CTE standards)

| CCTC | Code Number | KS Statement | Construction Technology | Sustainable Design 1 | Sustainable Design 2 | Course 4 | Course 5 | Course 6 |
|---------|-------------|---|-------------------------|----------------------|----------------------|----------|----------|----------|
| | | | TSA? | TSA? | Yes | TSA? | TSA? | TSA? |
| AC-MO 1 | COMO01 | Recognize and employ universal construction signs and symbols to function safely in the workplace. | X | | | | | |
| AC-MO 2 | COMO02 | Use troubleshooting procedures when solving a maintenance problem to maintain buildings and structures. | | | X | | | |
| AC-MO 3 | COMO03 | Apply construction skills when repairing, restoring, or renovating existing structures. | | | X | | | |
| AC-MO 4 | COMO04 | Determine work required to repair or renovate an existing building or structure. | | | X | | | |
| AC-MO 5 | COMO05 | Plan and practice preventative maintenance activities to service existing structures. | | | X | | | |
| AC-MO 6 | COMO06 | Maintain and inspect building systems to achieve safe and efficient operation of facilities. | | | | | | |

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Masonry Focus Area

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Focus Area Knowledge and Skills (CTE standards)

| CCTC | Code Number | KS Statement | Construction Technology | Sustainable Design 1 | Sustainable Design 2 | Course 4 | Course 5 | Course 6 |
|------|-------------|---|-------------------------|----------------------|----------------------|----------|----------|----------|
| | | | TSA? | TSA? | Yes | TSA? | TSA? | TSA? |
| | ACMS01 | Understand safe use of equipment in elevated masonry work. | | | | | | |
| | ACMS02 | Perform appropriate construction inspection and quality control. | | | | | | |
| | ACMS03 | Understand the safe use of equipment and materials in high-rise construction work. | | | | | | |
| | ACMS04 | Use appropriate masonry tools and equipment. | X | X | X | | | |
| | ACMS05 | Understand the components of mortar and how to mix those components properly. | X | | | | | |
| | ACMS06 | Understand masonry units and installation techniques. | | X | | | | |
| | ACMS07 | Apply masonry techniques to residential construction. | | | | | | |
| | ACMS08 | Understand and use appropriate techniques for reinforced masonry. | | | | | | |
| | ACMS09 | Understand how metal work is used in masonry. | | X | | | | |
| | ACMS10 | Apply advanced masonry laying techniques. | | | | | | |
| | ACMS11 | Understand the relationships between masonry construction techniques and moisture control. | | | | | | |
| | ACMS12 | Apply appropriate masonry construction techniques to a variety of materials and conditions. | | | | | | |
| | ACMS13 | Repair and restore masonry structures. | | | | | | |

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Plumbing Focus Area

2016

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Focus Area Knowledge and Skills (CTE standards)

| CCTC | Code Number | KS Statement | Construction Technology | Sustainable Design 1 | Sustainable Design 2 | Course 4 | Course 5 | Course 6 |
|------|-------------|--|-------------------------|----------------------|----------------------|----------|----------|----------|
| | | | TSA? | TSA? | Yes | TSA? | TSA? | TSA? |
| | ACPL01 | Perform general plumbing practices. | | | | | | |
| | ACPL02 | Prepare and install building drainage systems. | | | | | | |
| | ACPL03 | Prepare and install vents. | | | | | | |
| | ACPL04 | Prepare and install traps. | | | | | | |
| | ACPL05 | Join pipes and fittings. | | | | | | |
| | ACPL06 | Install plumbing fixtures. | | | | | | |
| | ACPL07 | Layout and install water supply lines. | | | | | | |
| | ACPL08 | Install hot water systems. | | | | | | |
| | ACPL09 | Perform safety inspections. | | | | | | |
| | ACPL10 | Conduct plumbing service and repair. | | | | | | |

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Residential Electric Focus Area

2016

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Focus Area Knowledge and Skills (CTE standards)

| CCTC | Code Number | KS Statement | Course 1 TSA? | Course 2 TSA? | Course 3 TSA? | Course 4 TSA? | Course 5 TSA? | Course 6 TSA? |
|------|-------------|--|------------------|------------------|------------------|------------------|------------------|------------------|
| | ACRE01 | Apply electrical theory to circuits including concepts of alternating current. | | | | | | |
| | ACRE02 | Use electrical test equipment. | | | | | | |
| | ACRE03 | Understand how to use the National Electrical Code® | | | | | | |
| | ACRE04 | Prepare electrical conduit for installation. | | | | | | |
| | ACRE05 | Identify and Install fasteners and anchors. | | | | | | |
| | ACRE06 | Install raceways, boxes, cable trays, and fittings. | | | | | | |
| | ACRE07 | Install Conductors | | | | | | |
| | ACRE08 | Read and understand electrical blueprints. | | | | | | |
| | ACRE09 | Install wiring in switches and enclosures in commercial settings. | | | | | | |
| | ACRE10 | Install wiring in residential settings. | | | | | | |
| | ACRE11 | Understand the principles of grounding. | | | | | | |
| | ACRE12 | Install boxes and fittings. | | | | | | |
| | ACRE13 | Prepare conductor terminations and splices. | | | | | | |
| | ACRE14 | Install electrical services. | | | | | | |
| | ACRE15 | Understand circuit breakers and fuses. | | | | | | |
| | ACRE16 | Understand contactors and relays. | | | | | | |
| | ACRE17 | Install electric lighting | | | | | | |
| | ACRE18 | Calculate loads for branch and feeder circuits. | | | | | | |
| | ACRE19 | Select appropriate conductors. | | | | | | |
| | ACRE20 | Determine appropriate overcurrent protection. | | | | | | |
| | ACRE21 | Understand requirements for raceway, box, and fitting fill. | | | | | | |
| | ACRE22 | Understand requirements for wiring devices. | | | | | | |
| | ACRE23 | Understand and inspect distribution equipment. | | | | | | |
| | ACRE24 | Understand the purpose and function of lamps, ballasts, and their components. | | | | | | |
| | ACRE25 | Use appropriate wiring methods for hazardous locations. | | | | | | |
| | ACRE26 | Identify practical lighting requirements. | | | | | | |
| | ACRE27 | Identify and install heat tracing and freeze protection systems. | | | | | | |
| | ACRE28 | Complete high voltage terminations and splices. | | | | | | |

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Sheet Metal HVAC Focus Area

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Focus Area Knowledge and Skills (CTE standards)

| CCTC | Code Number | KS Statement | Course 1 TSA? | Course 2 TSA? | Course 3 TSA? | Course 4 TSA? | Course 5 TSA? | Course 6 TSA? |
|------|-------------|---|------------------|------------------|------------------|------------------|------------------|------------------|
| | ACSM01 | Understand the safe use of equipment and tools used in sheet metal and HVAC. | | | | | | |
| | ACSM02 | Perform proper piping practices. | | | | | | |
| | ACSM03 | Perform soldering and brazing operations. | | | | | | |
| | ACSM04 | Identify fasteners, hangers, and supports and their use in sheetmetal and HVAC. | | | | | | |
| | ACSM06 | Understand the fundamental concepts related to heating systems. | | | | | | |
| | ACSM07 | Understand the fundamental concepts related to air distribution systems. | | | | | | |
| | ACSM08 | Read and interpret blueprints related to HVAC and sheetmetal projects. | | | | | | |
| | ACSM09 | Understand fundamental sheet metal planning and layout. | | | | | | |
| | ACSM10 | Understand principles of sheet metal fabrication. | | | | | | |
| | ACSM11 | Maintain heating and cooling systems. | | | | | | |
| | ACSM12 | Understand the relationship between indoor air quality and HVAC. | | | | | | |
| | ACSM13 | Design heating and cooling systems. | | | | | | |

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Sustainable Building Focus Area

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| | | | TSA? | TSA? | Yes | TSA? | TSA? | TSA? |
| | ACGR01 | Understand how fundamental science concepts and strategies are applied through building science. | | X | X | | | |
| | ACGR02 | Understand the rationale for sustainability and green building. | | X | X | | | |
| | ACGR03 | Explain the issues, concepts, strategies, and practices of sustainable site planning and land use. | | X | X | | | |
| | ACGR04 | Identify water-efficiency and management issues, concepts, strategies, and practices associated with green building. | | X | X | | | |
| | ACGR05 | Understand how energy is used in buildings and how energy-saving materials, systems, and techniques are utilized in green buildings. | | X | X | | | |
| | ACGR06 | Identify indoor environmental quality (IEQ) issues, concepts, strategies and practices associated with green building. | | X | X | | | |
| | ACGR07 | Understand how materials selection and use is applied in green building. | | X | X | | | |
| | ACGR08 | Identify green building industry tools and resources. | | X | X | | | |
| | ACGR09 | Understand how industry accepted practices associated with design, construction and certification impact green building. | | X | X | | | |