

District Career & Technical Education (CTE) Pathway Proposal: Architecture

The Career & Technical Education (CTE) Pathway proposal must be submitted to the CTE Coordinator for prior approval and must include the following information:

Name of State approved (CCCS) CTE Program:

Pathway Name: **Drafting & Design**

Sub-Pathway Name: **Architecture & Construction - Pre-construction Design**

Credit Type(s): **PRA, ELE**

Department Code: **EGR**

CIP Code: **480000**

I. GOALS

A. Provide a brief overview of the CTE Pathway.

DCSD is partnering with Arapahoe Community College to offer students a pathway in architecture where students can learn architectural drafting skills and obtain the basic technical training necessary to work in an architecture firm.

B. How does this CTE Pathway fit into the overall educational program?

CTE programs significantly increase not only the high school graduation rate, but also results in a higher percentage of students going to college and persisting through graduation. Students taking both academic and technical courses have lower dropout rates and better achievement gains than other students.

C. What benefits would students receive from this CTE pathway?

This pathway will provide exposure to some of today's top professional careers and allow students to attain skills which are relevant and desired by industry. DCSD students will have the opportunity to take architectural classes at the Legacy Campus, earn college credit through Arapahoe Community College, and can earn industry certificates such as CAD, Solidworks, and Revit so they can be immediately employable or transferred to a 2- or 4-year college or university. Students who continue in this pathway will be prepared for a variety of entry level positions that include Draftsperson or Computer Aided Design Technician.

II. CAREER & TECHNICAL EDUCATION (CTE) PATHWAY COURSES

A. Complete the table below indicating the course sequence students would take within the CTE program. Other courses may be added or changed within the program, based upon the need of students or program modifications.

New course names will be indicated in red text.

| <i>Level</i> | <i>State Approved Course Name:</i> | <i>State Approved Description:</i> | <i>Credit Type</i> | <i>Course Number</i> |
|--------------|------------------------------------|--|--------------------|----------------------|
| 2 | CTE Drafting & Design Technology | This class will cover the basic principles of the world of drafting and design and offers students the opportunity to combine design principles with technology to produce authentic projects. Students will explore the many aspects of how drafting and design can be used in architecture, industrial design, engineering, graphic arts and other professions. Students will develop an understanding of the visual elements and the principles of design and follow protocol dictated by drafting and design standards. Students will study both two and three-dimensional applications and problems. Students will use drafting tools to create drawings of preliminary sketches, orthographic projections, isometric, floor plans, and many others. Emphasis will be placed on paying close attention to detail such as line quality, neatness, correct use of tools and accuracy. All students are required to read and use a scale for measuring. After the design phase, students will be expected to use their plans to select items to produce. | PRA | 79091201 |
| 2 | CTE Architectural Drafting | Architecture is designed for advanced drafters to develop skills in the field of architectural engineering. This class will offer the experience in the development and design of structures using architectural design software. Students will develop drafting skills through reading architectural blue prints and | ELE | 79091202 |

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| | | <p>generating floor plans for real world applications. This course is designed to allow students to use their knowledge of CAD to create a set of house plans that meet city code requirements for the city. Students will use CAD software and draw a floor plan, plot plan, electrical plan, foundation plan, and elevation for their house as well as construct a model frame house</p> | | |
| | CTE Architectural Drafting | <p>Architecture is designed for advanced drafters to develop skills in the field of architectural engineering. This class will offer the experience in the development and design of structures using architectural design software. Students will develop drafting skills through reading architectural blue prints and generating floor plans for real world applications. This course is designed to allow students to use their knowledge of CAD to create a set of house plans that meet city code requirements for the city. Students will use CAD software and draw a floor plan, plot plan, electrical plan, foundation plan, and elevation for their house as well as construct a model frame house.</p> | ELE | 79091203 |
| | CTE CAD for Civil Engineering | <p>This overview of the fields of civil engineering and architecture emphasizes the inter-relationship and mutual dependence of both fields. Students use state-of-the-art software to solve real world problems and apply knowledge to hands-on projects and activities. By developing and implementing plans, students will experience firsthand job responsibilities of architects and civil engineers. By the end of the course, students will be able to give a complete three-dimensional rendering of buildings</p> | ELE | 79091204 |

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| | | and improvements, zoning and ordinance constraints, infrastructure requirements, and other essential project plans. (This course covers all competencies of CAD 233.) | | |
| | CTE Building Modeling | This introductory course in Building Information Modeling (BIM) focuses on CAD Construction Industry applications as a platform for learning key principles in the application of digital media in the design and documentation of building elements within a parametric environment. Fundamental training is provided, so students can progress to more advanced design computation and its application in the construction industry. Through a series of lectures and exercises, this course explores basic BIM concepts that apply to all parametrically driven CAD systems. (*This course covers all competencies of CAD 224 if course delivered using Revit software.) | ELE | 79091205 |
| | CTE Drafting & Design WBL | Students work on the job in a business related area and receive credit plus pay from employers. Students must provide their own transportation, have proper insurance forms, and work a minimum number of hours per semester. Students must successfully complete classroom requirements in order to receive credit for work experience hours. | ELE | 79099999S1 / 79099999S2 |
| | ACC-AEC 1200 Print Reading Residential/ Commercial | 3 ACC credits / .5 HS Credit Interpret construction prints and the related documents produced by the residential or commercial architect and used in the construction industry. Approved Course Fees | ELE | 6909101 |
| | ACC-AEC 1510 Building Materials | 3 ACC credits / .5 HS Credit This course will cover the study of building materials and methods | ELE | 6909102 |

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| | | <p>commonly used within the construction industry. The course will include interior and exterior materials used in everything from foundations to roof systems.</p> <p>Approved Course Fees</p> | | |
| | ACC-CAD 1101 Computer Aided Drafting/2D I | <p>3 ACC credits / .5 HS Credit</p> <p>Focuses on basic computer aided drafting skills using the AutoCAD software. Includes file management, Cartesian coordinate system & dynamic input, drawing templates, drawing aids, linetype and lineweights, layer usage, drawing & editing geometric objects, polylines & splines, array, text applications, creating tables, & basic dimensioning.</p> | ELE | 6909103 |
| | ACC-CAD 1102 Computer Aided Drafting/2D II | <p>3 ACC credits / .5 HS Credit</p> <p>Focuses on intermediate 2D Computer aided drafting skills using the AutoCAD software. Includes blocks, wblocks & dynamic blocks, hatching, isometric drawings, advanced dimensioning and dimension variables, layouts, paper space and viewports, templates, external references, attributes, raster images, & printing/plotting.</p> | ELE | 6909104 |
| | ACC-CAD 2220 Revit Architecture | <p>Introduces students to the AutoDesk Revit Architecture software. Examines the Building Information Modeling approach to 2D and 3D architectural construction documents. Students will create floor plans, elevations, sections, 3D models, perspective renderings and animations with this software application.</p> <p>3 ACC credits</p> | ELE | 69071 |
| | ACC-AEC 1250 Architectural Design and Modeling | <p>4 ACC credits / 1 HS Credit</p> <p>Introduces students to conceptual architectural design through manual drafting techniques including a variety of multi-view projection, isometric projects, and architecture details. The student will</p> | ELE | 6909105 |

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| | | <p>be required to produce a combination of manually drafted drawings, CAD drawings, and physical models. Students will develop and present a design solution and evaluation of the assigned program through conceptual models and architectural drawings.</p> <p><u>NEW Course Fees</u></p> | | |
| | <p>ACC-AEC 1520 Construction Materials & Systems</p> | <p>3 ACC credits / .5 HS Credit Examines building materials and construction techniques. Topics include a study of soils, concrete, brick, masonry, steel, timber, and plastics and a study of types of building structural systems and components. Principles of interpreting light commercial construction drawings (blueprints) for structural and trade information are also introduced. This course was previously listed as AEC 121.</p> <p><u>NEW Course Fees</u></p> | ELE | 6909107 |
| | <p>ACC-AEC 1100 Introduction to Design Theory</p> | <p>3 ACC credits / .5 HS Credit Evaluates design environments both physical and theoretical. Students will be encouraged to consider how social and individual behavior is reflected in and influenced by these designed environments. Through exploration of assigned readings and movies the student will critically assess how design influences our perception of the built environment that surrounds us and the design theory behind it. Note: This course was previously listed as AEC 100.</p> <p><u>NEW Course Fees</u></p> | ELE | 6909105 |
| | <p>ACC-AEC 1110 History of Architecture</p> | <p>3 ACC credits / .5 HS Credit This course will cover major periods of architectural development. Social and cultural values influencing architecture will be highlighted as well as the</p> | ELE | 6909106 |

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| | | <p>interaction of art, engineering and architecture as forms of expression. Note: This course was previously listed as AEC 125.Pre-req: ENG 1021.</p> <p>NEW Course Fees</p> | | |
| | ACC-CAD 1110 SketchUp | <p>3 ACC credits / .5 HS Credit</p> <p>Introduces techniques and common practices of 3D modeling using Sketchup software. Focuses on the creation and editing of virtual three-dimensional forms and volumes and the organization of their elements through the various features of the software. Includes applying material and textures, changing the appearance of models with styles and shadows and introduces the basic techniques of presenting and sharing the 3D model. Note: This course was previously listed as CAD 115.</p> | ELE | 6909108 |
| | ACC-CAD 2221 Advanced Revit Architecture | <p>3 ACC credits / .5 HS Credit</p> <p>Focuses on the advanced applications of the AutoDesk Revit Architecture software. Includes Family Editing, topographic Site Plans, Worksharing, Phases, Key Schedules, custom Annotation, Templates, and presentation techniques.</p> | ELE | 69072 |
| | ACC-AEC 2700 International Building Codes | <p>3 ACC credits / .5 HS Credit</p> <p>A study is made of the restrictions, standards, and requirements that in the interest of public safety and welfare have been established by law to govern the construction of buildings and their materials. Specifications are developed to describe building materials to be furnished and how they are to be installed.</p> | ELE | 6909008 |

Signature Page

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| Does the Career and Technical Education (CTE) Coordinator approve adoption of this program? <i>** Your signature below indicates your approval of the program.</i> |
| Signature _____ <i>Aimee Barker</i> |

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| Does the Chief Assessment Officer (or designee) approve adoption of this program? <i>** Your signature below indicates your approval of the program.</i> |
| Signature _____ <i>Matt Reynolds</i> |

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| Does the Assistant Superintendent approve adoption of this program? <i>** Your signature below indicates your approval of the program.</i> |
| Signature _____ <i>Danny Winsor</i> |

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| Does the Board of Education approve adoption of this program? | Yes | No |
| Date of BOE Meeting _____ | | |
| Signature _____ | | |

Superintendent File: IGA-E-2

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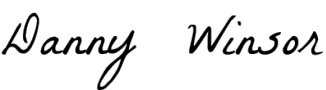
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| Course Number: | |
| Course entered in NCAA database if applicable. | |
| Update Graduation Competencies course document if applicable for Math and English courses. | |
| VIP Code: | |
| CIP Code: | |
| Add to HEAR list, if applicable. | |
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