**Course Description:**

Students learn blueprint reading as it relates to the architecture and construction. Students will use scaling, orthographic projections, dimensioning practices, symbols, notations, and abbreviations to perform area calculations and to interpret floor plan, section, and elevations. Using construction plans, students will identify problems or shortcomings related to the layout and installation of materials for the project.

**Strand 2. Safety, Tools, and Equipment**

Learners apply principles of protection, prevention and mitigation to create and maintain safe working conditions at construction sites. Knowledge and skills may be applied in all aspects of personal and site safety, including handling materials, using tools and equipment, working with and around electricity, using personal protective equipment and operating heavy equipment.

**Outcome 2.2. Personal Safety**

Practice personal safety in construction.

**Competencies**

2.2.1. Interpret personal safety rights according to the employee Right‐to‐Know plan.

2.2.2. Describe how working under the influence of drugs and alcohol increases the risk of accident,

lowers productivity, raises insurance costs, and reduces profits.

2.2.3. Select, use, store, maintain and dispose of personal protective equipment (PPE) appropriate

to job tasks, conditions and materials.

2.2.4. Identify workplace risk factors associated with lifting, operating and moving heavy objects

and establish an ergonomics process.

2.2.5. Identify, inspect and use safety equipment appropriate for the task.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pathways | X | Design | X | Mechanical, Electrical, Plumbing  | X | Structural |

**Outcome 2.3. Equipment Operation**

Operate equipment used to move materials, earth and other heavy materials.

**Competencies**

2.3.1. Select the equipment and attachments needed to complete the task.

2.3.2. Follow the manufactures’ recommendations for safety, maintenance, limitations and use.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pathways | X | Design | X | Mechanical, Electrical, Plumbing  | X | Structural |

**Strand 3. Structural Construction**

Learners apply principles of architectural engineering to erect residential, commercial and industrial buildings. Knowledge and skills may be applied in constructing footings and foundations; framing floors, walls, ceilings, roofs and stairs; completing exterior and interior finishes; and repairing, restoring or remodeling existing structures.

**Outcome 3.2. Site Management**

Analyze site management operations.

**Competencies**

3.2.1. Identify topographical and existing features of areas (i.e., property lines, utilities, streets,

setbacks) on survey maps (parcel map, survey plat).

3.2.2. Interpret features of a site plan.

3.2.4. Demonstrate an understanding of applicable building codes.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pathways | X | Design | X | Mechanical, Electrical, Plumbing  | X | Structural |

**Strand 6. Planning and Design**

Learners apply principles of architectural and civil engineering, drawing and construction with current technology to develop, present and use construction proposals, plans and schematics. Knowledge and skill may be applied throughout the project from preconstruction design through all stages of building in residential, commercial and industrial applications.

**Outcome 6.1. Proposals**

Develop and present a design, proposal, or concept.

**Competencies**

6.1.1. Collect and analyze data to identify required deliverables (e.g., reports, studies, building

designs, drawings) based on client specifications.

6.1.2. Create a visualization of a proposed project using data from relevant materials according to

client specifications and in compliance with building codes.

6.1.3. Incorporate building structural systems, environmental systems, safety systems, building

envelope systems and building service systems into the design.

6.1.4. Incorporate the Americans with Disabilities Act (ADA) Standards for Accessible Design.

6.1.5. Develop a narrative to describe the project.

6.1.6. Differentiate between residential, commercial, industrial and institutional construction

segments.

6.1.7. Present the comprehensive proposal.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pathways | X | Design | X | Mechanical, Electrical, Plumbing  | X | Structural |

**Outcome 6.4. Construction Drawings**

Read and interpret plans and diagrams within a construction drawing set (i.e., topographical, grading and drainage, architectural, structural, plumbing, mechanical, electrical) to organize a project work sequence.

**Competencies**

6.4.1. Collect and analyze project information to determine resources and tasks required to

complete a project.

6.4.2. Read and interpret a site plan.

6.4.3. Use architect’s and engineer’s scales to read and interpret construction drawings for material

calculations and installation at the jobsite.

6.4.4. Read, interpret, and organize construction drawings, specifications and other contractual

documents.

6.4.5. Describe various building sections, wall sections and other architectural details of residential,

commercial and highway construction.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pathways | X | Design | X | Mechanical, Electrical, Plumbing  | X | Structural |

**Outcome 6.5. Construction Math**

Calculate materials needed to complete construction projects.

**Competencies**

6.5.1. Find surface area and volume for three‐dimensional objects, accurate to a specified level of

precision.

6.5.2. Apply measurement scales to layout length, width, and angle measurements.

6.5.3. Apply algebraic procedures and geometric concepts to reading construction documents.

6.5.4. Use proportional reasoning and apply indirect measurement techniques (e.g., right triangle

trigonometry, properties of similar triangles).

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pathways | X | Design | X | Mechanical, Electrical, Plumbing  | X | Structural |