# Civil Engineering & Architecture Course No. 21012 Credit: 1.0

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| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes:Engineering & Applied Mathematics (14.0101)

Course Description: An **application level** course providing students with an overview of the fields of Civil Engineering and Architecture while emphasizing the interrelationship of both fields. Students typically use software to address real world problems and to communicate the solutions that they develop. Course topics typically include the roles of civil engineers and architects, project-planning, site-planning, building design, project documentation, and presentation.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Understanding the Field

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Compare and contrast civil engineering and architecture. |  |
| 1.2 | Understand careers related to civil engineering and architecture. |  |
| 1.3 | Communicate the current common practices utilized in civil engineering and architecture and apply them to develop a viable solution for an engineering or architecture project. |  |

## Benchmark 2: Project Management and Documentation

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Manage a civil engineering and architectural project by documenting proposed changes from review and feedback recommended by client within the project journal. |  |
| 2.2 | Identify needed elements (criteria & constraints) for project assessment and decision making |  |

## Benchmark 3: Click or tap here to enter text.

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Students will communicate understandings of the relationship of structures and land and the responsibility of designers to handle resources in an ethical manner. |  |
| 3.2 | Conduct a site survey locating various utilities, roadways, set-backs, and mechanical systems required for building placement. |  |
| 3.3 | Develop and be able to read a contour map. |  |
| 3.4 | Students will examine and assess the pros and cons of local, state, and federal regulations on site development. |  |

## Benchmark 4: Architectural and Civil Design

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Communicate ideas using various drawing methods including sketches, CAD systems and software. |  |
| 1.2 | Apply knowledge of architectural styles to the design of structures. |  |
| 1.3 | Design and create a utility plan to include electrical, plumbing, and sewer. |  |
| 1.4 | Calculate and determine heat loss and/or gain related to building structures. |  |
| 1.5 | Compare and contrast various elevation views and communicate their purpose. |  |
| 1.6 | Students will draw the exterior and interior elevations. |  |
| 1.7 | Compare and contrast section and detail views and communicate their purpose. |  |
| 1.8 | Draw section and detail views complete with appropriate architectural symbols. |  |
| 1.9 | Determine the live and dead loads of a structure using load tables and appropriate mathematics. |  |
| 1.10 | Identify regions of the United States that are susceptible to seismic loads. |  |
| 1.11 | Identify roofing materials, types of roof systems, rafters and trusses; calculate the load for roof members; and determine the architectural styles that will support the roof system design chosen for their project. |  |
| 1.12 | Determine the strength of columns and beams required for a structure. |  |
| 1.13 | Research various foundation types, draw sketches of each one, and describe their use. |  |
| 1.14 | Prepare a foundation detail. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

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