Course Description

ARC2312C | Introduction to Building Assembly Modeling | 4.00 credits

Introduction to the principles of Building Assembly Modeling. Students will learn to explore a building as an assembly of architectural objects and subassemblies using virtual design and construction software. In addition, students will learn part modeling, assembly modeling, generative drafting, and general representational and modeling techniques. Prerequisites: ARC2172, CGS1060, and MAC1105.

Course Competencies:

Competency 1: The student will explore the theory of building information modeling by:
1. Considering the implications of a life-cycle perspective in relation to design
2. Comparing concepts of sketching and the history of building modeling
3. Exploring the interface and terminology, workbenches, toolbar display, and customizing the graphic user interface
4. Starting a new project, starting a new part, starting a new assembly
5. Opening a part model, viewing a model from different orientation points, and changing the display settings
6. Saving a project and saving management techniques

Competency 2: The student will explore strategies for organizing the building modeling approach by:
1. Applying a top-down approach to modeling
2. Applying a bottom-up approach to modeling
3. Modeling components in context

Competency 3: The student will become familiar with the concept of a sketch to drive geometry by:
1. Applying the sketch concept in the work environment
2. Sketching lines, arcs, rectangles, and circles
3. Trimming overlapping shapes
4. Creating dimensions needed to fully define a sketch
5. Identifying when a sketch is under-constrained or over-constrained

Competency 4: The student will become familiar with part modeling by:
1. Applying the sketch concept in the work environment
2. Sketching lines, arcs, rectangles, and circles
3. Trimming overlapping shapes
4. Creating dimensions needed to fully define a sketch
5. Identifying when a sketch is under-constrained or over-constrained

Competency 5: The student will become familiar with part modeling by:
1. Creating an extruded (pad) object from a sketch
2. Modifying pad features, including thin pad
3. Creating subtractive geometry from a sketch (pocket feature), thin pocket
4. Using projection to create a sketch to create a new pad
5. Creating and transforming a sketch
6. Importing a 2D CAD geometry into a sketcher to generate a new pad
7. Working with limits to capture a design intent
8. Exploring feature-based editing tools, such as fillet, chafer shell, slots, rib, and groove
9. Exploring multi-sections
10. Working with multiple bodies in a part

Competency 6: The student will become familiar with the concept of design intent by:
1. Explaining the theory of a design intent model
2. Creating relations in the sketcher using a formula to drive the design intent
3. Creating equivalent dimensions
4. Working with features, activating/deactivating, and applying selection sets
5. Working with variable edge fillets
6. Reordering of features, duplicating features and patterns such as rectangular, circular, and user-defined
7. Working with transform features such as symmetry, mirror, and scaling
8. Editing parent-child relationships, including resolving failed features

Competency 7: The student will become familiar with the process of developing an assembly model by:
1. Creating product properties
2. Moving components with the compass
3. Applying assembly constraints
4. Working with assemblies and sub-assemblies
5. Exploring multi-constraint tools and reusing existing patterns

Competency 8: The student will explore the process of publishing and documentation by:
1. Reviewing the feature creation history
2. Assigning material to parts
3. Determining the mass, volume, and surface area of the part
4. Taking measurements, generating quantities, and compiling a bill of materials
5. Performing a clash and clearance study
6. Using catalog parts
7. Creating a generative drawing
8. Placing a view on a sheet and manipulating the view in several ways

<u>Learning Outcomes:</u>
- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Demonstrate an appreciation for aesthetics and creative activities