The Engineering byDesign™ Industry Certification Pathway

Introduction

To encourage more students to work toward a selected industry credential while in high school, the Engineering byDesign™ Industry Certification Pathway was developed by ITEEA’s STEM Center for Teaching and Learning. By following the suggested pathway delineated in this document, educators can prepare students for a successful attempt at an industry certification through Onshape for the Associates Certification Exam. The Engineering byDesign™ Industry Certification Pathway includes the following courses: Foundations of Technology, Technological Design, and Engineering Design. Also, a stand-alone Onshape Associate Certificaton Course will be offered. This course can be utilized in any classroom to strengthen Onshape currently being taught in classes or serve as a course to be taught in its entirety as a standard Computer Aided Design course.

Included in this document are infographics that provide visual representations of the Engineering byDesign™ (EbD) three-year course sequences (p. 2).

Infographics

Each individual EbD™ course is delivered in 36 weeks. Educators should follow the curriculum with specific attention to the software focus assigned for each course. The stand-alone course is 18 weeks.

Three-Year Course Sequence

In Year One (blue callout in Figure 1 on the right side), students take Foundations of Technology, followed by Technological Design in Year Two (blue callout in Figure 1 on the right side), and Engineering Design in Year Three (blue callout in Figure 1 on the right side). All courses have a focus on Onshape. Toward the end of the Engineering Design course, students take the certification exam for Onshape (red callout in Figure 1 at the bottom).

One-Year Course Sequence

Throughout the course of the year, the Onshape Associates Certification Course can be used as a course taught throughout the course of 18 weeks or as a supplemental resource for instruction taught directly for Onshape. At the end of the course, students take the certification exam for Onshape (red callout in Figure 1 at the bottom).
Onshape Certified Associate Exam
Pathways and Outline

Figure 1:

Sketching
- Planes
- Line
- Circle
- Arc
- Fillets
- Point
- Use
- Trim/Extend
- Offset
- Mirror
- Pattern
- Dimensions
- Constraints
Features

- Extrude
  - Add
  - New
  - Remove
- Revolve
- Fillet
- Chamfer

Assembly

- Mates
  - Cylindrical
  - Planar
  - Parallel
  - Tangent
- Inserting Content
- Standard Content
  - Standards (ANSI, ISO)

Onshape Knowledge

- Materials
- Standard Content
- Renaming
- Part Studio/Assembly/Engineering Drawings
- Measure
- Mass Properties
- Keyboard shortcuts
  - https://cad.onshape.com/help/Content/shortcut_keys.htm

Modeling/Assembly Objects

- Bench Grinder
  - Engineering Drawings
    - Section View
    - Change sizes from one assignment to another
- Can Crusher
  - From 2D Engineering Drawings
  - Center of Mass

* Italicized items are not needed but can aid in efficiency for exam