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).

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Onshape Certified Associate Exam
Pathways and Outline

Figure 1:
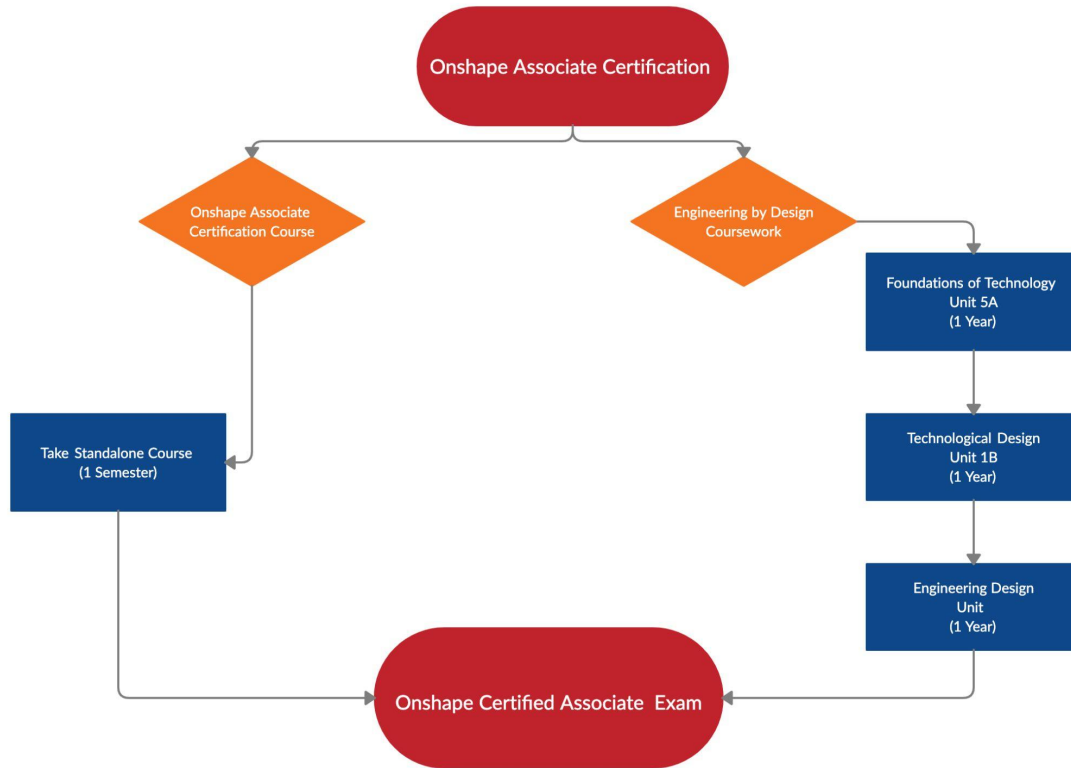
Sketching
- Planes
- Line
- Circle
- *Arc*
- Fillets
- *Point*
- Use
- Trim/Extend
- Offset
- *Mirror*
- *Pattern*
- Dimensions
- Constraints
  - https://www.onshape.com/en/resource-center/tech-tips/tech-tip-constraining-your-sketch

<u>Features</u>
- Extrude
    - Add
    - New
    - Remove
- Revolve
- Fillet
- Chamfer

<u>Assembly</u>
- Mates
    - Cylindrical
    - Planar
    - Parallel
    - Tangent
- Inserting Content
- Standard Content
    - Standards (ANSI, ISO)

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

<u>Modeling/Assembly Objects</u>
- 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