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Autodesk Certified Associate in CAM for Turning

Exam objectives

Target audience

The Autodesk Certified Associate (ACA) certification is designed for candidates with essential knowledge and skills in Autodesk software who are ready to enter the job market or improve their skills in pursuit of a new career path. Becoming an Autodesk Certified Associate is an excellent way for individuals with approximately 150 hours of Autodesk software experience to validate their product or workflow skills.

Candidates who obtain this certification will have demonstrated proficiency in computer-aided manufacturing (CAM) for turning using Autodesk Fusion 360. They will have exhibited entry-level skills in job planning and model preparation, work holding, proper tool path selection, creation, documentation, and validation for computer numerical control (CNC) lathe applications. Earning this certification can help differentiate candidates in the job market by validating their skills in CAM for CNC lathe.

Prerequisite skills

It's expected that candidates will already know how to:

- Navigate the user interface.
- Identify areas of the browser.
- Transition through various environments.
- Know the available file types.
- Display a part or assembly.
- Create fully constrained sketches.
- Extrude, hole, revolve, and thread features.
- Identify various planes and axes.
- Understand detailed drawing intent.
- Identify GD&T Symbols and their meanings.
- Create a CAM setup for CNC turning.

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- Create and manage a tool library.
- Calculate feeds and speeds.
- Create turning toolpaths for roughing and finishing.
- Create turning toolpaths for drilling and threading.
- Simulate toolpaths.
- Create a setup sheet.
- Export NC code for a single setup.

Exam objectives

Here are some topics and software features that may be covered in the exam.

1. **Plan and set up work**
   - **1.1. Demonstrate how to create and manage a tool library**
     - 1.1.a. Fusion Team cloud libraries
     - 1.1.b. Cutting data presets
     - 1.1.c. Tool compensation point
     - 1.1.d. Live tooling
   - **1.2. Recognize workholding requirements**
     - 1.2.a. Identify various types of chucks and workholding and their appropriateness
   - **1.3. Interpret a drawing/blueprint**
     - 1.3.a. Identify drawing information required for manufacture
   - **1.4. Demonstrate how to perform model prep**
     - 1.4.a. Identify tools and features required to prepare a model for manufacture
2. **Define CAM setup, machine, and stock**
   - **2.1. Specify the model, chuck, and safe Z for a given process**
   - **2.2. Specify the WCS and spun profile**
     - 2.2.a. Identify WCS location for 2-axis turning
   - **2.3. Define stock**
     - 2.3.a. Understand stock options available in Fusion 360
3. **Toolpath creation and optimization**
   - **3.1. Determine an appropriate toolpath strategy**
     - 3.1.a. Identify the appropriate toolpath or strategy

3.2. Describe a parting toolpath

3.2.a. Identify options while parting stock

3.3. Adjust toolpath parameters

3.3.a. Adjust toolpath parameters based on machining requirements

3.3.b. Modify toolpath settings to include or avoid geometry

3.4. Prepare external and internal threading toolpaths

3.4.a. Define thread pitch and depth in a toolpath

3.4.b. Identify threading toolpath issue and adjust parameters

3.5. Prepare on-center drilling and tapping toolpaths

3.5.a. Define drilling tools, cycle, and heights

3.6. Prepare Groove Toolpaths

3.6.a. Define and optimize a groove toolpath

3.7. Prepare Profile Rough and Finish toolpaths

3.7.a. Define grooving options in a profile toolpath

3.7.b. Identify profile toolpath options

3.8. Prepare a Chamfer toolpath

4. Simulation and verification

4.1. Identify how to simulate toolpaths to verify stock

4.1.a. Identify tool collisions

4.1.b. Identify toolpath information

4.2. Adjust toolpath settings based on simulation results

4.2.a. Adjust toolpath settings for turning and drilling based on simulation results

4.2.b. Adjust setup parameters based on simulation results, i.e., spun profile, safe Z, and chuck plane.

4.3. Identify how to determine tool collisions

4.4. Identify toolpath statistics and information

5. Documentation and output

5.1. Demonstrate how to create an NC program

5.1.a. Configure NC program options

5.2. Recall how to create Setup Sheets and the critical elements

5.2.a. Create notes on a Setup Sheet

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5.3. Interpret G-code to verify WCS and machine options

5.3.a. Identify coordinate system information in posted code

5.3.b. Identify tool changes, spindle speed and machine motion in posted code