

AGENDA / HORAIRE:

9:00am – 9:30am	Orientation / Séance d'information
9:30am – 12:00pm	Competition / Compétition
12:00pm – 1:00 pm	Lunch
1:00pm – 3:00pm	Competition / Compétition

AM Task: 2.5 hours

Reverse Engineering, Parametric Modelling and Assembly

You work for an organization that provides mechanical design and product development services. A customer has requested your services to help develop a CNC machine tending robot cell like the image shown below. The company has provided .STEP files for the robotic components but requires a parametric model of the Base to develop customized mounting solutions rather than the .STEP file that was provided. The customer would also like a functional parametric assembly to simulate the robot in their cell. They have also requested a detailed drawing package for the Base and an exploded view of the robot components. They would also like to see an animation of the robot's motion on each axis.



Deliverables:

Each file must be saved with the following naming format: Initials PS or S AM

Example: JBPSAM

1. Create a parametric model of the Base by reverse-engineering the .STEP file that has been provided. Add 5 equally spaced mounting cavities and holes as shown in the View and Annotation Guide rather than the 4 that are on the current model. Export and submit your Base as a .STEP file for evaluation.
2. Create a fully assembled parametric robot using all of the provided .STEP files with reference to the provided model and images in the View and Annotation Guide.
3. Complete a detailed drawing package as shown that align with the View and Annotation Guide and as follows:
Page 1: An isometric view and orthographic views, dimensions and annotations for the Base
Page 2: Exploded view of the full robot assembly with a parts list and balloons for each part
Page 3: Shows three different positions of the robot assembly
The drawing package MUST be exported as one PDF and submitted in PDF format. Please ensure the drawings are prepared in millimetres.
4. Capture one visually appealing screenshot or rendering of the fully assembled robot including all parts. Use reflections, shadows and perspective viewing. Please submit the file as a .jpg file with a resolution of 1834x1074.
5. Export your fully assembled file containing all models as a .STEP File and submit for review

Post-secondary Only:

6. With reference to Deliverable 3. Page 1, add GD&T Datum Identifier symbols in correspondence with the View and Annotation Guide and add positional tolerances to the 5 mounting holes in the Base with the following specifications:
 - Positional tolerance is .01mm at MMC
 - Use the three established datums in their applicable order with the positional tolerance

Evaluation:

A total of 50 points are achievable during the AM challenge. The following detail provides an overview of where the points will be awarded.

Secondary Marking

Deliverables 1/3 (Base Features and Annotations): 30 Points
Deliverables 2/3 (Assembly Views): 10 Points
Deliverables 2/4 (Assembly Rendering/Screenshot) 5 Points
Deliverable 5 (Exported STEP): 5 Points

Post-Secondary Marking

Deliverables 1/3/6 (Base Features and Annotations): 35 Points
Deliverables 2/3 (Assembly Views): 7 Points
Deliverables 2/4 (Assembly Rendering/Screenshot) 5 Points
Deliverables 5 (Exported STEP): 3 Points