

Lesson Plan (for educators)

CNC Turning



Lesson plan - 90 minutes

AIM:

Developing learner's CAD/CAM skills and understanding of engineering drawings to produce an accurate wireframe.

ACTIVITY:

Learners will utilise a variety of 2D modelling tools to efficiently create an accurate wireframe representation of a component.

Suitable for

Students undertaking: Manufacturing Engineering / CNC machining.

Resources needed

1. Video & LMS access (link)
2. Task brief
3. Technical drawing (supplied)
4. Marking criteria/scheme
5. Infrastructure list
6. H&S checklist
7. Skill fact sheet (WSUK)
8. End of assessment quiz

Skills

Self-management, informed, reflection, self-belief, drive, maths, geometry, efficiency, productivity, accurate interpretation of engineering drawings, precision.

Learning outcomes

After completing this activity learners will be able to:

- create 2D wireframes using CAD/CAM software
- think about how to plan for the task and put a strategy in place that can be used in similar tasks
- recognise the importance of using hotkeys to improve productivity and efficiency
- identify and apply mathematical and geometrical principles to create accurate component representations
- explore their own best strategies to produce the task
- learn how to complete the task within time, accurately and to standard
- recognise the importance of creating wireframes to the mid limit tolerance to ensure accuracy.

Delivery modes

1. Students can go through the online materials independently – either at your facilities, if you have access to enough computers, or at home in their own time.
2. You can download and print all relevant resources, access the video demo and deliver the activity in the classroom. MasterCAM HLE is available to download for free from <https://signup.mastercam.com/demo-hle-mms>

Section	Timings	Key teaching points
Lesson Plan	5 minutes	Introduce the topic and its relevance to skills competitions and how it directly correlates to the CNC manufacturing industry.
Video OR photo demonstration (ensure descriptors are provided for each photo)	10 minutes	Get students thinking about how they can plan their work to make the best possible use of time and maintain accuracy.
Task Brief (below)	10 minutes	Familiarise students with the key steps to complete the set task. Steps: <ul style="list-style-type: none"> • watch video • set-up hotkeys in MasterCAM • study example drawings • see the example of the completed task to standard • plan your sequence of operations for the task • complete the task • mark the task • repeat the task and improve on your score.
Infrastructure and H&S checklist	5 minutes	Infrastructure List: <ul style="list-style-type: none"> • printed copy of technical drawing • pen / highlighter • computer suitable for CAD/CAM • downloaded copy of MasterCAM HLE. H&S Checklist <ul style="list-style-type: none"> • Monitor, keyboard and chair are all in comfortable positions.
Task Completion - 1st attempt	20 minutes	Get students to complete the task by following the instructions on the task brief.
Marking Criteria	5 minutes	Provide the marking scheme to the learners and encourage learners to record their received marking on LMS. Please find the marking scheme in the resource library of this module. Do not forget to feedback to WorldSkills UK.
Task Completion - repeat	35 minutes	Get students to complete the task by following the instructions on the task brief. Allow them to explore their own ways of completing the task quicker - can they improve their score?