Additive Manufacturing

Section one
Moving from Competence to Excellence

A closer look at two key aspects of the Additive Manufacturing World Occupational Standard.

Aspect:	Total number of Marks (%)
A: Transfer-to-CAD and optimization	20
B: Component optimization/structural optimization	25

The WorldSkills Occupational Standard (WSOS) specifies the knowledge, understanding, and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business.

A: Transfer-to-CAD and optimization

What does competence look like in this area?

- Have a basic understanding of the 3D printing constraints which can impact the design solution.
- Create 3D CAD Models for 3D Printing.
- A good understanding of all the tools and functionality of the software commands.
- Able to work on basic scans, improve and repair meshes.
- Work from basic 3D scans – Design Polygonal Solutions from existing products.

What does excellence look like in this area?

- Being able to utilise the best possible supports or design to minimise the need of support in your design solutions.
- Understand how Computer Aided Engineering to and advanced level which allows you to optimise complex solutions to be created in the most efficient way (Hotkeys, tool libraries, etc).
- Advanced use of hotkey and shortcuts in the design stage.
- An excellent understanding of Design for Additive Manufacturing, optimising functionality of products

B: Component optimization/structural optimization

What does competence look like in this area

- Be able to utilise shape optimisation tools within CAE software.
- Consider part design based on 3D printing technology used – is it achievable?
- Consider what optimisations best suit the need of the part. E.g reduction in mass or volume.
- Some use of generative design

What does excellence look like in this area?

- Can utilise shape optimisation tools to the best of its ability to produce complex solutions time constrains.
- Being able to efficiently optimise component or assembly design in a short space of time with minimal errors.
- Full optimisation with the integration of lattice structures – part is functional.
- Detailed use of generative design.