Task 1 – Design

You must:

a) produce a detailed design specification that builds on the design criteria for the lifting device, including any references to research used
b) sketch and annotate up to three potential designs for the mechanical lifting device
c) select one appropriate design for development with justifications
d) select and justify the use of the materials and components needed for the proposed design
e) carry out calculations to support the proposed design:
    - the loading applied to any components of the design that are subject to stress
    - the mechanical advantage afforded by the design
f) create engineering drawings of the proposed design using CAD software
g) produce a virtual model of the proposed design using CAD software
h) create a bill of materials (BoM) listing all of the parts required in your final design proposal.

Conditions of assessment:

- the time allocated for this task is **14 hours**
- you must carry out the task on your own, under **controlled conditions.**

Controlled conditions:

- you must only work on the tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

What must be produced for marking:

- design specification
- up to three annotated sketches
- justification of the choice of one design for further development
- justification of the selection of the materials and components
- design calculations, including all workings
- engineering drawings of the design proposal
- outcomes of the virtual modelling of the proposed design, either as screen captures or printouts
- bill of materials
- any notes produced of research undertaken including citation of sources and internet search history.

Resources:

- access to the internet
- appropriate CAD software
- manufacturer’s datasheets (for materials and components)
- scientific calculator for design calculations.

The T Level is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.