Subject Overview

Emphasis is placed on maintaining student safety and confidence. They are encouraged to develop a higher level of substantive understanding of the properties of metals and of the machining and welding processes that can be applied to them. Student projects and processes initially constrain fabrication requirements to ensure students can work within specified tolerances. Later design projects allow students to engage with new and challenging activities that allow them to increase their skills, understanding and confidence in designing and delivering solutions.

Course Content

Students will complete projects working with a range of welding, cutting, machining and turning processes. Very clear instructions will be given around processes and safety, but students are increasingly responsible for the design composition of their projects and finding their own, best solutions to problems. There is an initial fabrication task which is designed to acquire skills and refine accuracy. The students’ second design investigation and development task requires them to develop their own design and formulate a process for its construction.

Students are required to evaluate the effectiveness of the processes and materials they use and to propose improvements for future examples.

Assessment will include:

- Practical tasks
- Safety and processes
- Design and Planning tasks
- Theory and research
- Workshop journal
- Product Evaluation

Assessment

Skills and Assessment Task:

Bar Clamp Fabrication Task

Students are provided with the specification and instructions to construct a basic bar clamp, including lathe, drilling, threading and welding operations. They are then required to construct components to specifications and within tolerance in a specified time.

Students are also required to produce an evaluation of the effectiveness of their processes and skills, suggesting possible improvements to either.

Skills and Assessment Task:

Design and Fabrication Task

Students develop their own design to address a problem, or to improve an existing design. The design must be properly researched as outlined in the Folio Task. Students use their findings to assemble their chosen project with particular care to safety and accuracy, completing the required evaluation for the folio task.

Folio Task:

The folio should contain a maximum of four pieces of evidence that illustrate the key design phases of investigating, planning, and evaluating. The combined evidence should be a maximum of 800 words if written or a maximum of 5 minutes of recorded oral communication, or the equivalent in multimodal form.