

Technology professional learning

Here at SSERC technology we have developed several hands-on practical courses to assist technology teachers, technicians, and other support staff to develop and enhance their engineering, woodworking, and Computer Aided Design (CAD)/Computer Aided Manufacture (CAM) skills.

These courses have been developed in a modular fashion that allows focus on specific core areas and develop key practical skills. These skills will prove useful in the successful delivery of metalworking/woodworking craft activities, design activities and teaching aspects of SQA based courses such as National qualifications.

An outline of these courses is given below. However, it should be noted that the offering is continually growing and further are planned. If any further information on any of courses is required, then please do not hesitate to contact the Technology team at duncan.lamb@sserc.scot.

Engineering bench skills

Engineering bench skills is a 2-day course which involves using a range of basic metalwork hand tools and equipment. It is ideally suited to individuals with limited metal working experience or those wishing to refresh their knowledge.

The course is delivered through participating in a range of practical tasks to build confidence and skill



Bench skills.

level. At least one project and a range of demonstration pieces be completed with all practical work being fully supported by demonstrations and presentations to cover theory of correct tool selection, use and care.

What's covered at a glance

- Work with a range of basic metalwork hand tools.
- Preparing and properly marking out metal.
- Cutting metal using the most appropriate method.
- Shaping and finish metal.
- Setting up and performing drilling operations safely.
- Develop skills and knowledge of safe working practices.

Fabrication skills

Fabrication skills allows technicians and teachers to gain confidence and skills in using equipment such as folding machines, guillotines, and spot welders. At least one finished project and a range of demonstration pieces will be completed which will develop skills in marking out, cutting, shaping, and forming sheet metal artefacts in a safe manner. Practical work will be supported by demonstrations and presentations covering the theory of correct tool selection, use and care.

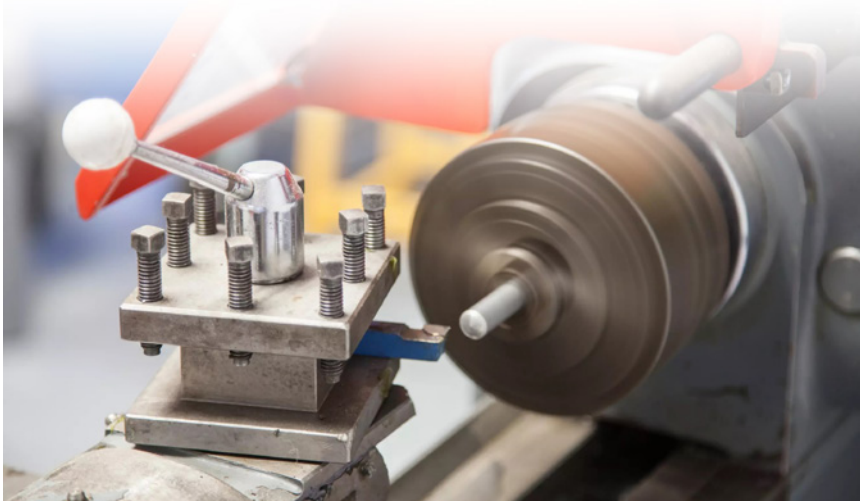
What is covered at a glance

- Work with a range of basic sheet metalwork hand tools.
- Preparing and properly marking out sheet metal.
- Cutting sheet metal using guillotine and notcher equipment.
- Forming sheet metal using benders and rollers into various shapes.
- Setting up and performing spot welding operations safely.
- Develop skills and knowledge of safe working practices. >>



Fabrication skills.

Activities & Professional Learning



Centre lathe turning.

Centre lathe turning

This course aims to develop your knowledge and understanding of the functions, machining operations and safe use of centre lathes. This course will allow teaching and support staff to implement lathe turning projects successfully and safely into the curriculum and/or deliver SQA based coursework.

This is a two-day course which will take place in an engineering workshop environment and will involve setting up and using several types of tooling to perform facing, taper, parallel, knurling, threading, drilling, and parting processes.

All aspects of machine parts, functions and safe use will be covered. Practical work will be supported by demonstrations from professionals and key presentations will cover the theory and safety aspects.

One-to-one guidance when performing machining operation will also be provided.

What is covered at a glance

- Safety precautions for the safe operation of the centre lathe.
- How to set tools and prepare the centre lathe for safe use.
- How to operate the centre lathe to carry out the following basic functions safely – facing off, parallel turning, taper turning, drilling, threading, turning between centres, parting, knurling, boring
- Understanding tool grinding angles and cutting speeds.
- Understanding work holding methods.

Hot & cold metal forming

The hot & cold metal forming two-day course looks at how to safely set up equipment used in forging processes. It will also develop

knowledge of various cold metal forming techniques, Personal Protective Equipment requirements and specific educational Health & Safety regulations regarding forges.

A full 2 days are spent in our workshop using the forge, associated equipment and the “Metalcraft” range of tooling. Many forging techniques will be covered and at least two projects will be completed with several practice pieces also being produced.

What is covered at a glance

- Risks and hazards associated with forging and using cold rolling equipment.
- Appropriate PPE (Personal Protective Equipment) for forging.
- A range of forging techniques to produce metal-based artefacts.
- Use cold rolling formers/benders.
- Develop skills and knowledge of safe working practices.

Welding skills

This two-day course will involve learning how to safely set up and use MIG, Arc and spot-welding equipment and their associated tools. It will also develop knowledge of various welding techniques, PPE requirements and specific educational Health & Safety regulations.

No prior experience of welding is required, and each participant will spend 2 full days in our workshop using the welding equipment to complete a range of basic welding tasks. Using various welding >>



Hot & cold metal forming.



Welding skills.

Activities & Professional Learning

techniques and joining methods. All practical work is supported by demonstrations and one-to-one tutoring.

What is covered at a glance

- Dangers of fumes, gases, and radiation when welding.
- Correct PPE for welding.
- Use welding equipment safely
- Setting up arc/MIG welding machines correctly.
- Commonly used welding joints i.e., T, Butt, and Lap joints.
- Safety implications of poor weld quality.
- Testing of completed welds.
- Develop skills and knowledge of safe working practices.

Woodturning

Our two-day woodturning course aims to develop your knowledge and understanding of the functions, machining operations and safe use of woodturning machines. It involves using several different turning tools to practice and hone wood turning techniques. All aspects of machine parts, functions, work holding methods and safe use are covered. Practical work will be supported by demonstrations from professionals and key presentations will cover the theory and safety aspects.

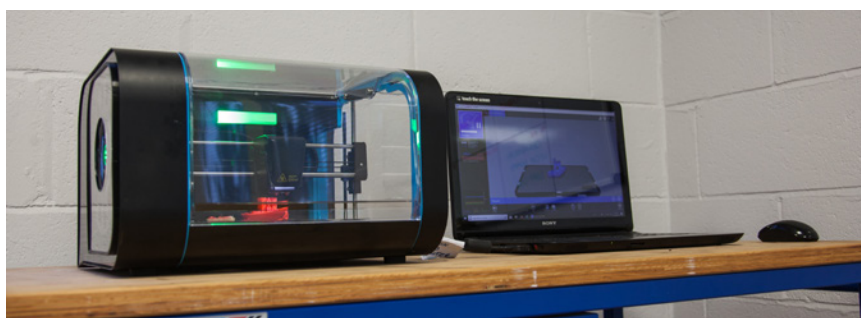
One-to-one guidance when performing turning operations is also provided and each participant will produce a variety of small, finished projects.

What is covered at a glance

- Component parts and functions of woodturning lathes.
- Work with a range of basic woodturning tools.
- Prepare and set up material in the lathe for turning between centres.
- Prepare and setup material in the lathe for faceplate turning.
- Shaping and finishing material.
- Develop skills and knowledge of safe working practices.



Woodturning.



Technology makerspace.

Technology makerspace

Our technology makerspace course has been developed specifically for technology teachers and technicians who wish to learn and develop skills in the following areas; laser cutting, 3D Printing, sublimation printing and vinyl cutting. These skills are essential for anyone wishing to introduce some of these newer technologies into the classroom.

Two days are spent looking at how to set up and use laser cutters, 3D printers, vinyl cutters and sublimation printing equipment. It will also look at ways in which this equipment could be used within the classroom and specific educational Health & Safety regulations.

No prior experience is necessary with any of the outlined equipment and each participant will produce several personalised projects at each using basic software, setting up the equipment and looking at how to maintain them for efficient

use. All practical work is supported by demonstrations, group work and one-to-one tutoring.

What is covered at a glance

- Laser cutters, 3D printers, Sublimation printers and vinyl cutters.
- Risks and hazards associated with such equipment.
- Types of software used and how to set up equipment for cutting/printing.
- Calibrating and maintaining equipment

Technology probationers residential

This is a two-day residential course based at SSERC HQ to support probationer teachers in Technology to deliver safe, high quality, hands-on practical STEM learning in the workshop. There is coverage across a range of technology curriculum organisers allowing individuals to develop their skills in and out of their subject specialism. >>

Activities & Professional Learning

The programme offers an excellent way of keeping up to date with developments in your subject area. The residential aspect of the course offers a great networking and peer engagement aspect for delegates, creating opportunities to build new working relationships with other probationer teachers across the range of schools and local authorities in Scotland.

The course is aligned to the GTCS Standards for Full Registration and the National Model for Professional Learning.

What is covered at a glance

- A range of basic skills in woodworking, metalworking, machining processes and 'new' technologies such as 3D printing and laser cutting.
- Health and safety and relevant safety measures within the technology workshop.
- A variety of teaching strategies to promote learning in technology including demonstrations, exploration of new concepts, skills, materials, and the use of real-life applications to design, problem solve and create.
- Network with fellow professionals and explore mechanisms for ongoing support.



Technology probationers residential.



Safe use of fixed workshop machinery.

- Understand the range of opportunities within the wider STEM engagement portfolio which SSERC offers.
- Evaluate their own professional learning and its impact on learners.

Safe use of fixed workshop machinery (2 SCQF points, Level 5)

Safe use of fixed workshop machinery is a two-day SCQF credit and levelled course that looks to develop safe use practices on bandsaws, circular saws, and planer thicknessers. It also covers procedures for carrying out associated tasks such as blade changing and the inspection and cleaning of dust extraction systems. The course is suitable for individuals who have completed a craft apprenticeship or have previous training/experience in using the equipment.

As outlined by the HSE (Health and Safety Executive), training should be refreshed every 3 to 5 years. As such a one-day refresher course is available to those who have attended the SSERC two-day course previously within this period.

What is covered at a glance

- Safe working practices of bandsaws, circular saws, and planer thicknessers.
- Blade changing procedures.



Maintenance of fixed workshop machinery and tools.

- Important of dust extraction.
- Correct PPE to use.
- Hazards and risks associated with each machine.
- Brief outline of PUWER (Provision and Use of Work Equipment Regulations).

Maintenance of fixed workshop machinery and tools (3 SCQF points, Level 6)

This is a three-day SCQF credit and levelled course designed to develop knowledge and skills in the safe methods of implementing a maintenance programme for hand tools, power tools, fixed machines, dust extraction and emergency stop systems. It looks at a complete range of technology related machinery and how to perform and record preventative maintenance checks. This course is usually only suitable for individuals who have previous experience in using/maintaining a range of wood and metalworking machinery.

What is covered at a glance

- How to implement a maintenance programme for hand tools and machinery in technical department workshops.
- Outline of PUWER regulations.
- Blade changing, abrasive belts and other common tool changing procedures.



SSERC Technicians courses

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