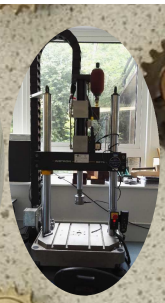
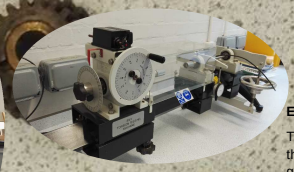
CEMPS
Who we are and what we do?

We are the technicians that help maintain and run over nine different laboratories being fluid dynamics laboratory, two physics teaching laboratory, electrical engineering laboratory, aerodynamics laboratory, thermodynamics laboratory and the two concrete laboratories.
In our team there is a total of nine however we work quite closely with the Mechanical Workshop Team and ExACT. Within the laboratory we provide assistance, a safe environment and equipment to those who are working within the laboratory, this means students, lecturers, other technicians and outside contractors.

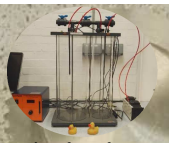
Ian, Dean, Henry, Dave, Julian.
Siobhan, Derek, Peter, Roger.



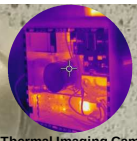
Instron
In the material testing laboratory we have three Instron machines that are used for tensile testing, compression, flexure testing and wear testing. First years end up using the instrons in understanding how different materials react when they are pulled apart. In the third year students are able to apply this knowledge in testing their chosen materials to aid their project.



Torsion Testing
Torsion testing is used for determining torsional rigidity and torsional shear strength for those who wish to use it within their third year projects



Expansion of a perfect gas
This piece is used by the third years to understand the gas laws.

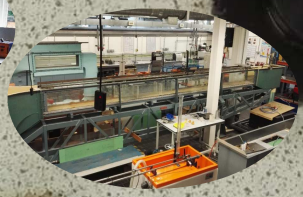


Thermal Imaging Camera
Used to measure heat signals from buildings, machines or experiments.

Hydraulic Benches
Within the teaching we use our four hydraulic benches to allow the students to explore how basic fluid mechanics work. Impact of a Jet, Losses in Bends, Bernoulli's Apparatus Experiment, flow over weirs and the surge tower.

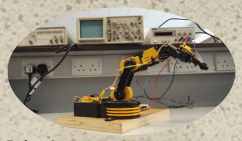
Large Flume Channel
Our large flume which is a new edition to the laboratory is currently being used for research however fourth year students have used it for the modelling of water flow over there designed bridge structure.

Thermodynamics Laboratory



Small Flume Channel
Where we show visitors and first years the effect of obstructions within the river bed on linear flow. We are also able to show them how a constriction within the channel also effects the flow along with creating a hydraulic jump visualised by using the ducks.

Material Testing Laboratory

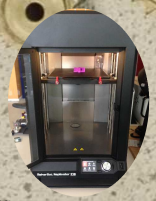


Robot Arm
Practical sessions over the three years allow the students to learn various techniques for projects. The robot arm, one such project involved using C-code to program for Arduino. This project was assisted by our electrical technician Peter.

Electrical Teaching Laboratory

Pelton Wheel
Within the first year of Engineering using the knowledge from experiments using impact of a jet the students are instructed on how to create and are given the basic components for them to design a Pelton wheel. The Pelton wheel is then designed by the students to be the most efficient shape to change kinetic energy into electricity.

Physics Teaching Laboratories



3D Printing
The physics teaching labs have use of two MakerBot 3D printers. Prototyping and manufacturing items in house allow students to easily make changes to the way their projects run. We frequently print wind turbines, beam splitters, lens/prism holders, gears, clamps, and anything else that's needed.

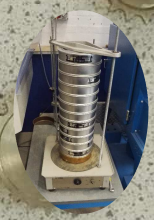
Cloud Chamber
Both teaching labs have access to a PHYWE cloud chamber that is used as a way to visually detect radiation for projects regarding cosmic background radiation.

Cameras
Students have access to several specialised cameras to use during their projects. A high speed camera for capturing fast events in great detail including radiation events, sound waves, and spinning turbines. A CMOS camera for detecting the faintest light passing through the lens of a telescope. Thermal imaging cameras to show the thermal effects of acoustic cooling and fire proofing.

Aerodynamics Laboratory

Wind Tunnels
We have six of various sizes and velocity. They are used for third and fourth years to evaluate the performance of their models.

Fluid dynamics Laboratory



Sieve Shaker
The shaker is designed to separate dried soils, sands or other building material into its different size aggregates. This allows accurate information to be gathered in the construction of concrete or the possible seepage effect on soils in dam construction.

Concrete Laboratory (Creating)

The Cement Mixer
Key to the process of concrete making, the concrete drum is kept in good condition in order for students to produce concrete cubes of 150mm^3 to 100mm^3 or create concrete beams to test in the concrete testing room. Various students projects consist of altering the mixing of the concrete procedure to test wither this makes stronger concrete.

Concrete Laboratory (Testing)

Concrete Testing Controls Equipment
Using the Controls equipment we are able to test out various types of concrete and other materials using the limits up to 800KN. This provides an interesting experience for the second year student as they are able to see if their cubes, in which they constructed are well made, if not it crumbles before the expected 167KN is applied.

Franklin Press
The Franklin Press is used with geological samples to see how much pressure is needed to be applied in order to split them. This is useful within the laboratories for the Geotechnics 2nd years modules. It is also used for the trip to Dartmoor in order to simulate the process of planning to build a dam within the area. In Dartmoor geological samples are taken in order to later on determine how much water the local bedrock would be able to withstand holding.

TSC Technical Services conference