

CAD/CAM

TEP Curriculum Enhancement Study

TEP are collaborating with a range of Computer Aided Design and Computer Aided Manufacture (CAD/CAM) companies to develop a representative range of CAD/CAM teaching resources for secondary education.

The TEP CAD/CAM Curriculum

Enhancement Study Units describe how to develop design concepts in CAD and produce an outcome using CAM. The Study



Units are designed to enable the student to follow a step-by-step guide to understanding Pro/DESKTOP and at the same time deliver the requirements of CAD/CAM in the national curriculum. Each chapter of the Study Unit introduces the student

to a broader range of computing skills and enhances their ability to use the full creative capacity of this exciting software.



Denford/Jaguar CAD/CAM Design Challenge

TEP are participating with Denford and Jaguar in the Formula One Car of the Future CAD/CAM Design Challenge. TEP's contribution will be the authorship of a Curriculum Enhancement Study Unit that illustrates how to design a car on Pro/DESKTOP. The Study Unit will act as a focused task to enable the student to understand the

computer modelling techniques required to complete the given design. Once the student has completed the Study Unit they can transfer their new skills and develop their own unique design.

The designs can be evaluated in terms of aerodynamic efficiency by using wind tunnels that will be accessible through a network of

Denford manufacturing centres around the UK. The student can change aspects of their design in light of the evaluation and evolve a more efficient model.

The TEP Curriculum

Enhancement Study Unit also describes how

to manufacture the design using Denford's MiniCAM programme and Microrouter machine. The text explains how to export a Stereo Lithograph File (STL) from Pro/DESKTOP into MiniCAM. The MiniCAM programme generates tool paths from the STL file and manufactures the 3D model.

The text describing the computer programme and machine set up procedure is supported by screen shots from MiniCAM and photographs of the Microrouter machine.



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The Study Unit will show how to design in Pro/DESKTOP using the Loft Through Profiles method of 3 Dimensional (3D) modelling. The illustration shows how the shape of the car design is built up from a series of cross sections. The CAD programme creates a solid model by generating surfaces between each of the sections to produce the complete body shape. The Loft Through Profiles method is a powerful modelling tool and can be used to produce a wide range of complex shapes.

Sculpting features into the main body to create the wheel arches and airfoil can further develop the resulting 3D shape.

The solid model must be exported

as a Sterio Lithography file so that the MiniCAM programme can interpret the shape and create toolpaths to drive the Microrouter machine.

The MiniCAM programme imports the STL file from Pro/DESKTOP and calculates the toolpaths required to drive the CNC machine and manufacture the design.

A simulation is shown of the design to illustrate how the final design will appear.

The Study Unit guides the student through the machine set up procedure with a

series of photographs. The photographs detail how to machine both sides of the design and produce a complete 3D model.

The TEP Curriculum Enhancement Study Units can be freely downloaded from the TEP website, www.tep.org.uk

