



AVCE - Engineering Medium Term Plan: Module 1: - Engineering processes

Module 1: Engineering Processes – Unit 9						
Sequence of Lessons	Theme/Aims	Key Activities	Resources	Student Outcomes	Assessment Opportunities	Key Vocabulary
1	Introduction to the unit and first project.	Discussion/introduction to the course, the first unit and then the first project. – The screwdriver. Demonstration of forging, hardening and tempering. Annealing. Safety. Students practice forging screwdriver blade using a piece of mild steel.	Brazing hearth. Mild steel silver steel. Files. Anvils Hammers. Tongs.	Forged and filed mild steel screwdriver blade.	All assessment is by workshop organisation and folio entries. 1. Logbook. 2. Risk assessment. 3. Service plan. Photographic evidence is also taken.	Names of tools and processes.
2	Making the blade.	Students forge and shape the blade using silver steel. Demonstration of case hardening. Exposition about the properties of steels.	Brazing hearth. Mild steel silver steel. Files. Anvils Hammers. Tongs.	Forged and filed silver steel screwdriver blade.	Website www.the-warren.org is used to support the course. Students to complete relevant interactive quizzes on processes and materials.	
3	Making the handle.	Demonstration of CAD/CAM to produce the handle from Aluminium. Demonstration of centre drilling and boring using the manual lathe to prepare the billet. Students make the handle	CNC lathe and PCs. Aluminium billet. Centre lathe.	Turned screwdriver handle.		

		using these processes. Exposition on how to complete record sheets. Students to complete sheets. As the opportunity arises. – technician interaction is essential.				
4	Joining the parts.	Finish components. Join using epoxy adhesive or screw thread or both. Final finishing. Students evaluate and test finished product.	Tap and die set. Epoxy resin. Abrasive papers and metal polish.	Completed project		
5	Casting project	Design a plaque on Prodesktp. Demonstrate conversion to STL file and post processing. Production on 3D machining centre. Students begin designs	PCs 3D machining centre.	Design for plaque.		
6	Machining in 3D	Students completed designs and then machine foam blocks.	Foam blocks and mounting boards. Hot melt glue.	3D machined Plaques.		
7	Sand casting	Demonstration of preparing for sand casting. Safety. Casting. Students prepare for sand casting.	Sand casting facilities.	Aluminium plaques.		
8	Finishing	Students complete sand casting. Drill mounting holes. Fettle up. Sandblasting, polishing and painting.	Sandblaster polishing materials.	Completed plaque.		
9	Copper Pot project.	Demonstration of cutting and joining copper and	Copper sheet and tube. Tin snips. Soft solder, flux	Copper pot top and base.		

		copper tube. Students complete.	and blowtorch.			
10	Cleaning up and finishing.	Students file rough edges off. Polish up by going through the grades. Apply a resist and etch in ferric chloride. Re-polish.	Files abrasives and metal polish. Vinyl shapes. Ferric chloride etch tank.	Finished and etched copper pot.		