Edinburgh Hacklab Training Card

Syllabus	*Version*	*Trainee Name*
CNC Mill	`d9b21bc`	

This card is only to be filled in by instructors authorised for this syllabus. Instructors will record your progress for each topic as follows:

D - Topic introduced/demonstrated by instructor.
1 - First attempt at exercise by trainee.
2 - Exercise completed by trainee with assistance.
3 - Exercise completed by trainee, further practice needed.
S - Trainee at satisfactory standard for this topic.

When all topics in a section have been covered, and you have been evaluated for that section, an instructor will sign next to the section heading. When all sections have been signed off, you will have successfully completed this training programme.

ID	*Topic*	*Progress*							
1	**Safety**								
1.1	Awareness of risks								
1.2	Use of safety measures								
2	**Basics**								
2.1	Turning on & startup								
2.2	Homing								
2.3	Feed & spindle override knobs								
2.4	Loading and unloading tools								
2.5	Setup and control of coolant system								
2.6	Cleaning machine area before and after use								
2.7	Shutdown and turn off								
3	**Manual & MDI operation**								
3.1	Jogging								
3.2	MDI								
3.3	Basic G-codes								
4	**Workholding**								
4.1	Understanding workholding requirements								
4.2	Use of workholding equipment:								
4.2.1	T-nuts								
4.2.2	Vice								
4.2.3	Parallels								
4.2.4	Step clamps								
4.2.5	Toe clamps								
4.2.6	Hex clamps								
4.3	Use of sacrificial material								
4.4	Clearance issues								
5	**Offsets**								
5.1	Theory of co-ordinate systems and offsets								
5.2	Squaring using a dial gauge								
5.3	Setting work offsets:								
5.3.1	Bare tools								
5.3.2	Slip blocks								
5.3.3	Edge finder								
5.3.4	Digital probe								

ID	*Topic*	*Progress*
6	**Tooling**	
6.1	Use of tooling:	
6.1.1	End mills	
6.1.2	Ball mills	
6.1.3	Chamfer mills	
6.1.4	Spot drills	
6.1.5	Drill bits	
6.1.6	Face mills	
6.1.7	Fly cutters	
6.1.8	Roughing vs finishing tools	
6.2	Use of collets	
6.3	Entering new tools	
7	**Job planning & toolpath creation**	
7.1	Job planning considerations	
7.2	Basics of modelling and CAM setup in F360	
7.3	Use of key operations:	
7.3.1	3D adaptive clearing	
7.3.2	2D facing	
7.3.3	2D contouring	
7.3.4	Drilling	
7.4	Theory and practice of speeds, feeds and depths	
7.5	Use of roughing and finishing passes	
7.6	Appropriate choice of height settings	
7.7	Control of tool operating areas	
7.8	Modelling of workholding fixtures	
7.9	Use of simulation to detect problems	
7.10	Use of machine-specific post processor	
8	**Running a CNC job**	
8.1	Loading programs	
8.2	Checklist before run	
8.3	Use of start, pause, stop and rewind controls	
8.4	Use of block search facility to start mid-program	
8.5	Watching for problems	
8.6	Recovery after emergency stop	