

**KALAMAZOO VALLEY COMMUNITY COLLEGE
RELATED TRADE INSTRUCTION**

TOOL & DIE

<u>COURSES</u>	<u>DESCRIPTION</u>	<u>CONTACT HOURS</u>	<u>CREDIT HOURS</u>
MATH 092	BASIC TECH MATH	48	3
MATH 106	TECH MATH 1	64	4
MSM 102	BASICS OF MECH TECH	32	2
DRFT 105	BLUEPRINT READING	32	2
MACH 103	FUND OF MACH TOOL OP	128	4
MACH 105	ADV MACH TOOL OP 1	112	3
MACH 220	NUM CONTROL CONCEPTS	96	4
MACH 230	COMPUTER AIDED MFG	96	4
TOTAL HOURS		608	26

OPTIONAL:

MACH 201	TOOL CONSTRUCTION	112	3
MACH 205	PLASTICS TOOLING CON	112	3
WELD 120	INTRO TO WELDING	112	3
DRFT 101	TECHNICAL DRAFTING	112	3
DRFT 150	COMPUTER-AIDED DRAFTING	128	4
MACH 221	ADVANCED NUM CONTROL	80	3

Kalamazoo Valley Community College
Apprenticeship Department

SUGGESTED SCHEDULE OF WORK EXPERIENCE
For

TOOL & DIE APPRENTICES

APPROXIMATE HOURS

- | | |
|---|-------|
| 1. Power hack saw
Selecting cutting blade, proper speed, clamping and measuring | _____ |
| 2. Lathe
Centering, facing, straight turning, shoulder turning, taper turning, threading, knurling, checkwork (drilling, boring, reaming, finishing, chuck and face plate turning) | _____ |
| 3. Drill press
Drilling, reaming, counterboring | _____ |
| 4. Surface grinder
Selecting grinding wheel, mounting wheel, surface grinding, angle grinding, squaring, method of holding work, form and dovetail grinding | _____ |
| 5. Cylindrical grinder
Selecting and mounting grinding wheel, straight and taper cylinder grinding, cutter, face and form grinding | _____ |
| 6. Internal grinder
Selecting and mounting grinding wheel, dressing wheel, mounting work in chuck, mounting work in face plate, rough and finish cuts | _____ |
| 7. Milling machine
Rough milling, remove stock, milling to accurate depth, accurate depth and various width cuts, angle cuts with cutter, taper and face milling, T-slot milling, make jigs and fixtures | _____ |

(OVER)

- 8. Simple die and fixture _____
Filing, assembling, layout of holes, lapping, measuring with height gauge, hack-sawing, layout and make simple dies and fixtures

 - 9. Bench, layout and assembly _____
Filing, assembling, layout of holes, lapping, measuring with height gauge, hack-sawing

 - 10. Heat treating _____
How to harden steel, how to cure, hardened steel, how to draw steel, colors of various heats, different kinds of steel-S.A.E. classification, testing hardness of steel, annealing
- Total _____

DESCRIPTION
TOOL & DIE MAKER

Analyzes specifications, lays out metal stock, sets up and operates machine tools, and fits and assembles parts to fabricate and repair metalworking dies, cutting tools, jigs and fixtures, gauges, and machinists' hand tools, applying knowledge of tool and die design and construction, shop mathematics, metal properties, and layout, machining, and assembly procedures: Studies specifications, such as blueprints, sketches, models, or descriptions, and visualizes product to determine materials required and machines to be used to fabricate parts. Computes dimensions, plans layout, and determines assembly method and sequence of operations. Measures, marks, and scribes metal stock for machining. Sets up and operates machine tools, such as lathes, milling machine, shaper, and grinder, to machine parts, and verifies conformance of machined parts to specifications. Lifts machined parts manually or using hoist, and positions and secures parts on surface plate or worktable, using devices, such as vises, V-blocks, and angle plates. Smooths flat and contoured and surfaces, using scrapers, abrasive stones, and power grinders, and fits and assembles parts together and into assemblies and mechanisms, using hand tools. Verifies dimensions, alignments, and clearances, using measuring instruments, such as dial indicators, gauge blocks, thickness gauges, and micrometers. Heat-treats tools or parts. May connect wiring and hydraulic lines to install electrical and hydraulic components. May examine standard or previously used dies, tools, and jigs and fixtures, and recommend design modifications regarding construction and function of part. May develop specifications form general descriptions for specialty tools and draw or sketch design of product. May specialize in repair work.