

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: Mechanical Fitting

CODE NO. MCH 221

PROGRAM: Mechanical Engineering Technician -- Machining

SEMESTER: Three

DATE: August 1986

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NEW: XX **REVISION:**

APPROVED:

Chairperson

Date

Mechanical Fitting
Course Name

MCH 237
Course Number

PHILOSOPHY/GOALS:

To familiarize students with methods of assembly, disassembly, aligning and installing of machinery. Also to diagnose parts for wear, replace or repair, then reassemble and put back into service. To eventually be able to build and repair machinery used in industries such as steel mills, auto manufacturing, pulp mills, etc.

METHOD OF ASSESSMENT (GRADING METHOD):

<i>SHOP CONDUCT AND PERFORMANCE</i>	<i>_____</i>	<i>20%</i>
<i>PROJECTS ASSIGNED BY INSTRUCTOR</i>	<i>_____</i>	<i>40%</i>
<i>3 CLASS TESTS (ESSAY)</i>	<i>_____</i>	<i>40%</i>

(1st, = 70%; 2nd., = 70%; 3rd., = 20%)

NOTE: Loss of 7% per hr for times absent & late.

TEXTBOOK(S):

Advanced Machine Technology
Millwright Manual of Instruction

OBJECTIVES:

To understand the topics outlined and be able to put them into practice in a job situation.

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
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General Introduction to Fitting and Relationship to Machining.

Tolerance and Fits

- shrink
 - driving
 - force
 - bump
 - push
 - press
- Interference**

- sliding
 - running
 - metal to metal
- Clearance**

Factors Affecting Fits

- types of material
- wall thickness
- length of fit
- location of fit
- method of removal
- application requirements

Bearings - Types

- ~ sleeve
 - box
 - sliding
 - ball
 - roller
 - tapered roller
 - needle
- Friction**
- Anti-Friction**

bearing metals & materials
pouring babbitt
bearing scraping, grooving
and chamfering

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
5	1)	Lubrication of Bearings - type of lubrication - method lubrication - when to lubricate	
6	2	Bearing Installation - heating - oil bath - induction - oven - open flame - temperature check - safe temperature	
7	2	Antifriction Bearing Clearances - clearance checks - clearance subject to type of service - precision bearings	
8	2	Couplings - Types - folk - fast - omega flex - love-joy - cross-key - chain	
9	2	Coupling Alinement - types of misalinement - choice of coupling to accommodate misalinement - matching bearing with coupling	
10	2	Selecting a Coupling - load required - alinement - shock - vibration - interrupted motion	

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
11	2	Fitting a Coupling - type of fit amount of fit set screw location mounting methods timing (certain application) removal consideration	
12	2	Gear Reducers - Types - worm - planetary - compound - internal spur gear	
13	1	Lubrication and Maintenance of Gear Reducers	
J4	2	Gear Reducer Installation - levelling and alignment	
15	2	Keys - Types - feather (Pratt & Whitney) - woodruff - gibb - kennedy - taper - step - saddle - norberg - lewis - barth	
16	2	Key Installation and Removal - measurement check before installation - removal by - press - heat - drift - combination	

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
M	2	<p>Seals and "O" Rings</p> <ul style="list-style-type: none"> - application requirements - types - identification - tolerance - installation and removal <p>Clutches</p> <ul style="list-style-type: none"> - types <ul style="list-style-type: none"> - friction - mechanical - fluid - magnetic - air - balancing and adjustment - mounting 	
J 9	2	<p>Belt Drives</p> <ul style="list-style-type: none"> - types <ul style="list-style-type: none"> - vee <ul style="list-style-type: none"> - single - multi-vee - flat - cog or Jink - alignment of pulleys - tension adjustment 	
20	2	<p>Chain Drives</p> <ul style="list-style-type: none"> - single roller - multi-roller silent - sprocket alignment - tension adjustment - lubrication 	
21	2	<p>Conveyors</p> <ul style="list-style-type: none"> - types function assembly, installation and maintenance 	
22	2	<p>Machine Installation</p> <ul style="list-style-type: none"> - locating levelling grouting anchoring <ul style="list-style-type: none"> - types of fasteners 	

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
23	1	<p><i>Hand Tools</i></p> <ul style="list-style-type: none"> - use and care of - safety 	
24	I	<p><i>Air Tools</i></p> <ul style="list-style-type: none"> - use and proper maintenance - safety - airline filters and condensation traps 	
25	3	<p><i>Rigging</i></p> <ul style="list-style-type: none"> - equipment <ul style="list-style-type: none"> - hoisting and balancing - rolling - skidding - blocking - hand signals (overhead crane) - use of hoists <ul style="list-style-type: none"> - hand - electric - pneumatic - use of jacks <ul style="list-style-type: none"> - hydraulic - mechanical - use of winches and snatch blocks - safe use of <ul style="list-style-type: none"> - slings <ul style="list-style-type: none"> - ropes - cables - chains - scaffolding <ul style="list-style-type: none"> - erection - anchoring and securing 	
26	1	<p><i>Fasteners</i></p> <ul style="list-style-type: none"> - nuts, bolts & studs - strength grades and head markings - torque calculations - lock nuts & lock washers - fit classifications 	
	J	<p><i>Machinery Cleaning and Degreasing</i></p> <ul style="list-style-type: none"> - steam - super hot water(alone) or with detergents - hot tank - manually - protect against rusting 	

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
28	1	Machinery Storage <ul style="list-style-type: none"> - shut down - power off - oil sump check - prevent against rusting - crating and blocking - record of shut down time etc. 	
29	}	Housekeeping <ul style="list-style-type: none"> - clean work bench - floor free of clutter - box and tag or mark parts - soak up oil spills 	
30	J	General/ Safety <ul style="list-style-type: none"> - know work area - exits ~ fire extinguishers - local hazards - toxic chemicals, gas and other flammables 	