SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title	Mechanical Fitting
Code No	MCH 237-3
Program:	Mechanical Engineering Technician - Machining
Semester	Three
Date	August 1986
Author:	Robert Zuccato

New XX Revision:

APPROVED L.P. Arguette

Chairperson Date

Mechanical Fitting MCH 237-3

Course Name **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.

METHODS OF ASSESSMENT (GRADING METHOD):

SHOP CONDUCT AND PERFORMANCE	20%
PROJECTS ASSIGNED BY INSTRUCTOR	40%
3 CLASS TESTS (ESSAY)	40%
(1st., = 10%; 2nd,, = 10%; 3rd., = 20%)	

NOTE: Loss of 1% 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
		General Introduction to Fitting and Relationship to Machining.
		Tolerance and Fits
		- shrink
		- driving
		- force **Interference**
		- bump
		- push
		- press
		- sliding
		- running **Clearance**
		- metal to metal
		Factors Affecting Fits
		- types of material
		- wall thickness
		- length of fit
		- location of fit
		- method of removal
		- application requirements
		Bearings - Types
		- sleeve
		- box **Friction**
		- sliding
		- ball
		- roller
		- tampered roller **Anti-Friction**
		- needle
		- bearing metals & materials
		- pouring babbitt
		- bearing scraping, grooving and chamfering
		Lubrication of Bearings
		- type of lubrication
		- method of lubrication
		- when to lubricate

TOPIC NO.	PERIODS	TOPIC DESCRIPTION
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** - falk - fast - omega flex - love-joy - cross-key - chain
9	2	**Coupling Alignment** - types of misalignment - choice of coupling to accommodate misalignment - matching bearing with coupling
10	2	**Selecting a Coupling** - load required - alignment - shock - vibration - interrupted motion
11	2	**Fitting a Coupling** - type of fit - amount of fit - set screw location - mounting methods - timing (certain application) - removal consideration

TOPIC NO,	PERIODS	TOPIC DESCRIPTION
12	**2**	**Gear Reducers - Types** - worm - planetary - compound - internal spur gear
13	1	**Lubrication and Maintenance of Gear Reducers**
14	**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
17	2	**Seals and "O" Rings** - application requirements - types - identification - tolerance - installation and removal
18	2	**Clutches** - types - friction - mechanical - fluid - magnetic - air - balancing and adjustment - mounting

TOPIC NO.	PERIODS	TOPIC DESCRIPTION
19	**2**	**Belt Drives** - types - vee - single - multi-vee - flat - cog or link - alignment of pulleys - tension adjustment
20	2	**Chain Drives** - single roller - multi-roller silent - sprocket alignment - tension adjustment - lubrication
21	2	**Conveyors** - types - function - assembly, installation and maintenance
22	2	**Machine Installation** - locating - levelling - grouting - anchoring - types of fasteners
23	1	**Hand Tools** - use and care of - safety
24	1	**Air Tools** - use and proper maintenance - safety - airline filters and condensation traps
25	3	**Rigging** - equipment - hoisting and balancing - rolling - skidding - blocking - hand signals (overhead crane) - use of hoists - hand - electric - pneumatic

TOPIC NO.	PERIODS	TOPIC DESCRIPTION
		- use of jacks - hydraulic - mechanical - use of winches and snatch blocks - safe use of - slings - ropes - cables - chains - scaffolding - erection - anchoring and securing
26	1	**Fasteners** - nuts, bolts and studs - strength grades and head markings - torque calculations - lock nuts and lock washers - fit classifications
27	1	**Machinery Cleaning and Degreasing** - steam - super hot water (alone) or with detergents - hot tank - manually - protect against rusting
28	1	**Machinery Storage** - shut down - power off - oil sump check - prevent against rusting - crating and blocking - record of shut down time etc.
29	1	**Housekeeping** - clean work bench - floor free of clutter - box and tag or mark parts - soak up oil spills
30	1	**General Safety** - know work area - exits - fire extinguishers - local hazards - toxic chemicals, gas and other flammables