SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE: MACHINE SHOP PRACTICAL I

CODE NO. : MCH133 **SEMESTER:** 1

PROGRAM: MECHANICAL TECHNIQUES – INDUSTRIAL MAINTENANCE

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DATE: AUG 2003 **PREVIOUS OUTLINE DATED:** N/A

APPROVED:

_____ _____
DEAN **DATE**

TOTAL CREDITS: 8

PREREQUISITE(S): N/A

HOURS/WEEK: 8

I. COURSE DESCRIPTION:

This course will allow the student to develop the skills required to operate the various machines and equipment necessary to work safely and productively in a machining, manufacturing and maintenance setting with a focus on building parts or making repairs in industry. Special attention will be placed on accurate measurement and inspection. Minimum of 95% attendance for all classes is expected.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Work in a safe manner in all onsite and shop situations.
   Potential Elements of the Performance:
   - use general shop safety rules
   - wear proper safety equipment in the shop
   - operate machinery in a safe manner
2. Use all of the various measuring tools (direct and transfer) to accurately take sizes of machined parts.
   Potential Elements of the Performance:
   - use direct measuring tools such as 6 and 12 inch scales; outside and inside micrometers bevel protractors; Vernier calipers; Vernier height gauges; thread micrometers
   - use transfer measuring tools such as inside and outside calipers; hermaphrodite calipers; telescopic gauges; small hole gauges, dividers
3. Use all tools required for layout and also develop an understanding of when to use layout
   Potential Elements of the Performance:
   - use layout tools such as combination set; protractors; height gauges; surface gauges; dividers; prick punch; solid square
4. Operate lathe to using various work holding devices.
   Potential Elements of the Performance:
   - use work holding devices on lathe such as 3 jaw chuck – regular and reverse jaws; 4 jaw independent chuck; centers (live, half-dead, dead , bell and driving); collet chuck; mandrel; face plate and lathe dog; magnetic chuck; steady and follower rests
5. Operate lathe to do various machining operations.
   Potential Elements of the Performance:
   - complete various, machining operations on lathes such as turning; facing; boring; threading; taper turning; knurling; grooving and parting off; trepanning

6. Operate various types of Drill Presses to do the different drilling operations.
   Potential Elements of the Performance:
   - operate sensitive drill press; operate radial arm drill press; select and sharpen drills for various types of metal and job situations; spot face counter bore, ream and tap using a drill press; use drill jigs to locate hole positions; make set-ups using vee blocks, parallels, angle plates using appropriate clamps
7. Use and care for hand tools such as wrenches, screw drivers and hammers, etc.
   Potential Elements of the Performance:
   - selection and use of proper hand tools including hammers, screw drivers, wrenches, socket sets, pry bars, punches, chisels, files, etc.
8. Use care for and re-sharpen the many types of cutting tools used in machining.
   Potential Elements of the Performance:
   - select, sharpen, care for and use all types of cutting tools such as lathe turning and boring, high speed steel (H.S.S.) and carbide tools, milling cutter, H.S.S. and carbide, drills, reamers, taps broaches, counter bores
9. Operate different types of Grinders safely and efficiently.
   Potential Elements of the Performance:
   - operate surface grinders
10. Operate different types of Saws safely and efficiently.
    Potential Elements of the Performance:
    - operate horizontal band saw for cutting off stock
    - operate circular cold cut saw
    - operate vertical contour band saw with file attachment
    - weld blades for vertical band saw
11. Select proper saw blade for operation performed.
    Potential Elements of the Performance:
    - select band saw blades for pitch, tooth from, set and width to correspond with material type and thickness
    - adjust and set bad speed for various material types and thickness

III. TOPICS:

1. Work safely in shop situations
2. Use all of the various measuring tools to accurately take sizes of machined parts
3. Use all tools required for layout and develop an understanding of when to use layout
4. Operate lathe using various work-holding devices
5. Operate lathe to do various machining operations
6. Operate various types of drill presses to do the different drilling operations
7. Use and care for hand tools such as wrenches, screw drivers, hammers
8. Use and care for and re-sharpen the many types of cutting tools used in machining
9. Operate different types of grinders safely and efficiently
10. Select proper grinding wheel to suit job applications
11. Operate different types of saws safely and efficiently

Note: All of the topic areas listed above will be covered in the course, but not necessarily in the order listed. More time may be devoted to certain topics, depending on student individual needs.

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Machine Fundamentals Text and Workbook
Machinist Tool Kit
Sharp Scientific Calculator (EL531 – Advanced DAL)
Safety Glasses, Safety Boots
Shop Coats (Recommended for protection of clothing)
Hairs nets required when hair long enough to touch the collar

Note: Safety Equipment is mandatory when working in shop area. Students working in the shop cannot wear rings, jewelry, ties or shorts. Students without proper attire will be denied access to equipment and will be considered absent from class.

V. EVALUATION PROCESS/GRADING SYSTEM:

Evaluation:
Test pieces and projects will be evaluated based, quality, accuracy and surface finish. (Time sheets will be provided on a weekly basis and used for evaluation) **80%**
Initiative, attitude, ability, cooperation, work ethic & attendance **20%**
TOTAL **100%**

The following semester grades will be assigned to students in postsecondary courses:

Grade	**Definition**	*Grade Point Equivalent*
A+	90 – 100%	4.00
A	80 – 89%	
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
S	Satisfactory achievement in field /clinical placement or non-graded subject area.
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

VI. SPECIAL NOTES:

Bursary:
Two student bursaries are awarded each year to students based on highest applied academic standards with perfect attendance.

Time Sheets:
In an effort to help students maximize their time in the shop, we are insisting that they fill out a time sheet each week with a record of the number of hours spend on every project they worked on during that week. These will be handed in at the end of each week for review with the professor.

Record of Tasks:
Upon successful completion of a given task the student will be issue a record of completion for that task. These records will help determine the level of ability and assist the instructor in determining the student's practical mark.

Assignments & Projects:
Assignments & projects will be submitted to the professor at the time specified. All parts must be permanently marked with their identification. Late assignments and projects will receive a grade of zero, except in the case where the student has had extenuating circumstances and has contacted the professor prior to the due date.

It is the student's responsibility to contact the professor prior to class in the event they are absent and provide a legitimate reason. Students shall treat shop classes as their job in the hope that this will cultivate proper work ethic.

Guidelines on Conduct:
Reliability: Neither industrial work places or Sault College can, or will tolerate tradesmen (students) taking time off without adequate reason or without maximum possible notice. A very real part of reliability is the ability to carry out responsibilities with a minimum of supervision.

Attendance/Punctuality: Attendance is mandatory for all classes unless specifically excused. This also includes any organized field trips both locally and out of town. Medical absence must be substantiated with a written note from either a doctor or the College Health Nurse. Punctuality is as important as demonstrations may occur at the beginning of a class.

Drugs: Drugs and machinery do not mix. The use of drugs will result in immediate dismissal from the College.

Alcohol: It is imperative that students are able to focus in the learning and attend to the safety issues in the shops. Students are not permitted in class under the influence of alcohol.

Breaks: To be determined by the instructor. Unauthorized breaks and absences will not be tolerated and will be considered when determining the student's final mark.

Clean-up: Clean-up begins 10 minutes prior to the end of class. All equipment must be cleaned and tools must be accounted for before any students leave the class.

Special Needs:
If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 2493 so that support services can be arranged for you.

Retention of course outlines:
It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:
Students should refer to the definition of "academic dishonesty" in Student Rights and Responsibilities. Students who engage in "academic dishonesty" will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:
The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources. Substitute course information is available in the Registrar's Office.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.