

I. COURSE DESCRIPTION:

This course will focus on the student's ability and understanding of the theoretical aspects of machining and manufacturing. This course will cover precision measurement, hand tools, speeds, feeds, threading and various machines used in industry in the repair and manufacture of equipment and components. Students will also gain knowledge of types, properties and applications of lubricants.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. *Have an awareness of safety in the operation of machines and tools used in the mechanical trades.***Potential Elements of the Performance:**

- Gain an understanding of shop safety.
- Develop safe work habits.
- Recognize and correct unsafe work conditions.
- Identify hazards when operating machine shop equipment.
- Identify hazards while working with hand, electric and air powered hand tools.

2. *Understand measurement and be able to use and care for various measuring tools.***Potential Elements of the Performance:**

- Measure using gage blocks.
- Measure angles using sine bar.
- The correct use gauges.
- How to use comparison measurement.
- Measure with light waves.
- Understand surface finish measurement.

3. *Accurately layout using drawings and sketches***Potential Elements of the Performance:**

- Explain importance of layouts.
- Identify common layout tools.
- Safe use of layout tools while performing layouts.

4. *Safely operate various grinders used in industry.***Potential Elements of the Performance:**

- Identify various types of grinders.
- Understand the need for various types stones
- Dress a grinding wheel.
- Change a grinding wheel.

- Grinder safety.

5. *Identify the different drill presses and hand drills.*

Potential Elements of the Performance:

- Drill press safety.
- Selecting type of drilling machine.
- Discuss various drill series available.
- Calculate proper speed and feed based on drill type and material selection.
- Sharpening a twist drill bit.
- Practice safe work holding while drilling.

6. *Safely operate various cutoff and band saws.*

Potential Elements of the Performance:

- Choose the type of saw based on application.
- Identify various saws available.
- Inspect and safely change blades on different saws.
- Sawing safety.

7. *Select and use proper hand tools based on application.*

Potential Elements of the Performance:

- Hand tool safety.
- Identify the correct sized wrenches.
- Identify the correct screwdriver style
- Identify different types of files.
- Identify hand tools used in Mechanical trades.
- Care and maintenance of hand tools.

8. *The lathe, determine speeds, feeds and calculate thread parameters and tapers using formulas.*

Potential Elements of the Performance:

- Lathe safety.
- Lathe operation.
- Identify parts of the lathe.
- Identify various work holding devices on a lathe.
- Calculate speeds and feeds.
- Calculate thread parameters using formulas.
- Calculate information required to cut tapers.

9. *The Milling machine, determine speeds, feeds and type of cutting tool to suit the application.*

Potential Elements of the Performance:

- Milling machine safety.
- Milling machine operation.
- Identify parts of the Milling machine.
- Identify various work holding devices on a Milling machine.
- Calculate speeds and feeds.

- Identify various cutting tools for the correct application.

10. *Understand the types, properties and applications of lubricants.*

Potential Elements of the Performance:

- Identify lubricants used in different machines.
- Identify the different types of lubricants.
- Importance of viscosity in lubricants.
- Identify lubricants used in machining operations
- Practice safe handling of lubricants.

III. TOPICS:

1. Shop and machine safety.
2. Measurement.
3. Accurate layout.
4. Care and operation of grinders.
5. Care and operation of various band saws and cutoff saws.
6. Safe use of drill presses and hand drills.
7. Care and selection of hand tools.
8. Lathe operation.
9. Milling machine operation
10. Lubricants

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- Technology of Machine tools textbook
- Technology of Machine tools workbook
- Scientific calculator
- Binder with paper
- Pens and pencils

V. EVALUATION PROCESS/GRADING SYSTEM:

<i>Tests</i>	<i>80%</i>
<i>Attendance (90%)</i>	<i>20%</i>
<i>Total</i>	<i>100%</i>

The following semester grades will be assigned to students:

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

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.

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.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

Substitute course information is available in the Registrar's office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations, in addition to announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will not be granted admission to the room.