



**I. COURSE DESCRIPTION:**

To provide students with a working knowledge of the theory behind the procedures that is used in the making and working with carbon steels, aluminum and its alloys, and other construction materials as well as knowledge and applications of fasteners. Practical lab / shop activities will be used to enhance and / or demonstrate theoretical concepts where possible.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

**1. *Understand Metals and Alloys***Potential Elements of the Performance:

- Identify and describe properties of metals and alloys
- Identify and describe the effects of temperature on metals and alloys.

**2. *Define the following properties of metals and alloys:***Potential Elements of the Performance:

- Define and describe each of the following mechanical and physical properties and / or terms:
  - Elasticity
  - Yield Point / Strength
  - Tensile ,Compressive, Shear, Bearing strength
  - Conductivity
  - Corrosion
  - Ductility
  - Malleability
  - Hardness
  - Impact Strength
  - Temperature effects

**3. *Describe the purpose for adding the following to steel:***Potential Elements of the Performance:

- Carbon
- Sulphur
- Phosphorus
- Silicon
- Manganese
- copper

**4. Identify and describe the uses of non-metallic materials:**

Potential Elements of the Performance

- rubber
- plastic
- nylon

**5. Bolts, Fasteners and Gasket Materials**

Potential Elements of the Performance:

- Identify the types, applications and qualities of fasteners including
  - Unified - American - National - Acme
  - Metric and Pipe thread systems
- Identify and select bolts, nuts, clips, chemical fasteners and adhesives as well as their potential use and application
- Describe methods of securing machinery and components using bolts, anchors, fasteners, grouting and epoxy resins

**III. TOPICS:**

1. Metals and Alloys
2. Mechanical and physical Properties of Metals
3. Additive materials in steel
4. Non-metallic materials
5. Bolts, Fasteners and Gasket Materials

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

- Machining Fundamentals textbook
- Machining Fundamentals workbook
- Scientific calculator (**not a cell phone**)
- Binder with paper
- Pens and pencils

**No Cell Phones are Permitted in  
The Classroom or Shops**

## V. EVALUATION PROCESS/GRADING SYSTEM:

<b>Tests / Assignments</b>	<b>70%</b>
<b>Labs / Projects</b>	<b>20%</b>
<b>Student Attitude / Personal performance</b>	<b>10%</b>

*(Attendance, performance, attitude (Will be explained in detail in class)*

**Note: 1% of final mark deducted for every inexcusable missed hour of class. )**

The following semester grades will be assigned to students in other than post-secondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	4.00
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:**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 enclosed, the learning process has begun. Late arrivers will not be granted admission to the room.***

**VII. COURSE OUTLINE ADDENDUM:**

The provisions contained in the addendum located on the portal form part of this course outline.