SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

SAULT COLLEGE

COURSE OUTLINE

COURSE TITLE:	MACHINE TECHNOLOGY

CODE NO. :	MCH257	**SEMESTER:**	FOUR

PROGRAM:	MECHANICAL PROGRAMS

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DATE:	JAN 2011	**PREVIOUS OUTLINE DATED:**	JAN 2010

APPROVED:

"Corey Meunier" _____

  CHAIR   DATE

TOTAL CREDITS:	3

PREREQUISITE(S):	NONE

HOURS/WEEK:	3

I.   COURSE DESCRIPTION:
This course will deal with Material Handling Systems, Prime Movers Pollution control and Wind power generation. Specific Materials Handling topics covered will include, belt, bucket, screw, pneumatic, roller, chain, apron, slurry, and food handling conveyors. Specific Prime Mover topics will include various combustion engines, Gas and steam turbines, with mention to fans, blowers and electric motors. Specific pollution control will include Treatment systems for Water and Air, collectors and precipitators. Specific Wind energy topics include a breakdown of each component required to produce energy using a wind turbine. Students will be required to write reports on assignments and develop assigned topics for presentation.

II.   LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1.   Select a Belt Conveyor for the correct application.

   Potential Elements of the Performance:
   - Apply various types of belts used for conveyors
   - Apply belt repair practices commonly used
   - Classify various parts and accessories of a conveyor system
   - Select the correct style of Belt take-up to be used
   - Explore the various Drive styles used
   - Document belt inspections, maintenance and other repairs

2.   Select a Bucket, Screw or Roller systems

   Potential Elements of the Performance:
   - Identify the various types of bucket elevators used
   - Identify the bucket elevator components
   - Identify the various Screw conveyor components
   - Explore drive assemblies and shaft couplings for conveyors
   - Identify screw conveyor designations
   - Explain gravity roller conveyors
   - Explain live roller conveyors
   - Classify roller conveyor components

3.   Select Pneumatic conveyors(including fans and blowers)

   Potential Elements of the Performance:
   - Identify the different vacuum conveying systems

- Explain Low, Medium and High Pressure conveying systems
- Compare combination vacuum-pressure conveyor systems
- Explain air-slide gravity conveying systems
- Classify centrifugal blowers and fans

4. *Explain Apron feeders*

Potential Elements of the Performance:
- Classify apron conveyors with various types of supports
- Explain buckets for apron conveyors
- Explain chain for apron conveyors

5. *Select Chain and Chain conveyors.*

Potential Elements of the Performance:
- Identify Flight and Drag conveyors
- Explain the different Rivets and their uses
- Explain transfer tables

6. *Classify food handling conveyors*

Potential Elements of the Performance:
- Identify belting used for food handling
- Identify Sprockets, Chain, Bearings, for food handling conveyors
- Explain various other types of conveyors in food handling

7. *Analyze Internal combustion engines*

Potential Elements of the Performance:
- Identify Diesel, Gas and High-compression engines
- Explain Four-stroke engine design
- Explain Two-stroke engine design
- Explore the thermodynamic cycles
- Apply maintenance procedures to each style of engine

8. *Classify AC and DC motors*

Potential Elements of the Performance:
- Identify major motor components
- Explain AC motors
- Explain single and three phase
- Explain DC motors
- Classify various windings

9.   *Explore Steam turbines and their uses in industry, their components and principles of operation.*

Potential Elements of the Performance:
- Explain principle of operation
- Identify various Castings and flows
- Explain back-pressure, and condensing turbines
- Identify and explain each functioning component
- Recognize thermodynamic principles across the turbine
- Analyze the need for the Pre-start up procedure

10.   *Explore Gas turbines and their uses in industry, their components and principles of operation.*

Potential Elements of the Performance:
- Explain principles of operation
- Identify various types of gas turbines
- Identify each component, control style and auxiliary system
- Analyze the need for the Pre-start up procedure

11.   *Identify the correct type of Ventilation or Pollution Control system for use in industry*

Potential Elements of the Performance:
- Classify treatment systems for Water
- Classify treatment systems for Air
- Explain Cyclone principles
- Explain Collectors and their differences
- Explain Precipitators and their differences

12.   *Identify major components and Explain operating principles for a wind energy turbine.*

Potential Elements of the Performance:
- Identify and explain each functioning component
- Explain principle of operation
- Explain electrical power generation from a wind turbine
- Apply maintenance procedures to each style of turbine

III. TOPICS:

1. BELT CONVEYORS
2. BUCKET , SCREW AND ROLLER SYSTEMS
3. PNEUMATIC CONVEYORS
4. APRON FEEDERS
5. CHAIN AND CHAIN CONVEYORS
6. FOOD HANDLING SYSTEMS
7. INTERNAL COMBUSTION ENGINES
8. AC AND DC MOTORS
9. STEAM TURBINES
10. GAS TURBINES
11. VENTILATION AND POLLUTION CONTROL

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:
Millwright Manual, Computer Access, Other research materials

V. EVALUATION PROCESS/GRADING SYSTEM:
Assignments- *90%*
Attendance- *10% (12/15)* **See special notes**
All assignments and materials handed in must be in proper format (as per reports template) and typed.

The following semester grades will be assigned to students:

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:

Attendance:
A student who attends less than 80%(12) classes will receive a zero(0) for 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.

VII.   COURSE OUTLINE ADDENDUM:

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