SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	PREVENTIVE /PREDICTIVE MAINTENANCE		
CODE NO. :	MCH.254	**SEMESTER:**	2
PROGRAM:	MECHANICAL ENGINEERING PROGRAMS		
AUTHOR:	CAM PUCCI – CAM.PUCCI@SAULTCOLLEGE.CA		
DATE:	JAN 2011	**PREVIOUS OUTLINE DATED:**	JAN 2010
APPROVED:	"Corey Meunier" **CHAIR**		**DATE**
TOTAL CREDITS:	2		
PREREQUISITE(S):	N/A		
HOURS/WEEK:	2		

(705) 759-2554, Ext. 2610

I. COURSE DESCRIPTION:

The student will learn about the various procedures and equipment used as well as processes associated with a preventive /predictive maintenance program. Other forms of maintenance programs currently being used will also be examined. Topics include the various approaches to maintenance, vibration and analysis. The student will design and carry out actual maintenance programs on various mechanical equipment.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Understand and explain Breakdown Maintenance.

Potential Elements of the Performance:

- Discuss the history of breakdown maintenance
- Explain the disadvantages of breakdown maintenance
- Understand catastrophic failures and their consequences to production
- Understand the cost associated with breakdown maintenance
- Explain why breakdown maintenance is used

2. Understand and explain Preventative Maintenance.

Potential Elements of the Performance:

- Discuss the history of preventative maintenance
- Explain the advantages of preventative maintenance
- Discuss cost savings to production using preventative maintenance
- Understand the importance of proper planning
- Understand problems associated with Preventative Maintenance
- Understand the importance of using equipment files and record keeping
- Understand the importance of training workers to use preventative maintenance practices properly
- Understanding the importance of having trained skilled trades people

3. Understand and explain Predictive Maintenance.

Potential Elements of the Performance:

- Discuss the history of Predictive Maintenance
- Discuss the advantages of Predictive Maintenance

- Explain and understand what “prediction” means in maintenance
- Explain the process of designing a Predictive Maintenance System

4. Understand and explain Proactive Maintenance.

Potential Elements of the Performance:

- Discuss the make up of a good Proactive Maintenance System
- Discuss various equipment used in Proactive Maintenance
- Discuss monitoring techniques used by production and maintenance
- Discuss root causes of failures in machinery

5. Explain and understand other maintenance systems.

Potential Elements of the Performance:

- Discuss total productive maintenance
- Discuss preventive engineering
- Discuss reliability engineering
- Discuss productive maintenance

6. Discuss Vibration Analysis and Balancing.

Potential Elements of the Performance:

- Discuss and understand vibration in machinery
- Explain terminology terms used
- Discuss the cause of vibration
- Discuss the tools used to determine excessive vibration
- Discuss control methods of vibration and equipment used
- Discuss the problems associated with excessive vibration
- Discuss balancing procedures

7. Discuss various types of inspections used on components.

Potential Elements of the Performance

- Discuss visual inspections
- Discuss types of dyes used and precautions
- Discuss Magnetic Particle Inspection
- Discuss Current inspection
- Discuss Ultrasonic Inspection
- Discuss Radiographic Inspection
- Discuss contamination control
- Discuss Particle Analysis

8. Explain and understand Laser Alignment Equipment.

Potential Elements of the Performance

- Explain the use of laser alignment equipment
- Discuss the advantages of using modern alignment techniques
- Discuss the problems associated with Alignment procedures

III. TOPICS:

1. BREAKDOWN MAINTENANCE
2. PREVENTATIVE MAINTENANCE
3. PREDICTIVE MAINTENANCE
4. PROACTIVE MAINTENANCE
5. OTHER MAINTENANCE AVAILABLE
6. VIBRATION AND BALANCING
7. INSPECTIONS
8. LASER ALIGNMENT

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Millwright manual, Note books, calculator

V. EVALUATION PROCESS/GRADING SYSTEM:

Activities and Assignments	*20%*	*Attendance/Attitude*	*10%*
Tests	*50%*	*Final Exam*	*20%*

1% deducted from attendance for every inexcusable hour missed from class.

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:

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.