

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: PREVENTIVE /PREDICTIVE MAINTENANCE
CODE NO. : MCH254 **SEMESTER:** 1
PROGRAM: MECHANICAL PROGRAMS
AUTHOR: Cam Pucci – www.campucci@shaw.ca
DATE: Aug/06 **PREVIOUS OUTLINE DATED:** Jan/06
APPROVED:

DEAN **DATE**
TOTAL CREDITS:
PREREQUISITE(S): none
HOURS/WEEK: 2

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For additional information, please contact Colin Kirkwood, Dean
School of Technology, Skilled Trades, Natural Resources & Business
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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 machinery in and out of the school.

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 preventive maintenance
 - Explain the advantages of preventive maintenance
 - Discuss cost savings to production using preventive maintenance
 - Understand the importance of proper planning
 - Understand problems associated with Preventive Maintenance
 - Understand the importance of using equipment files and record keeping
 - Understand the importance of training workers to use preventive 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. Preventive 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:

Note books, calculator

V. EVALUATION PROCESS/GRADING SYSTEM:

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

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

Grade	<u>Definition</u>	<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:

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 professor and/or the Special Needs office. Visit Room E1101 or call Extension 2703 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.

<include any other special notes appropriate to your course>

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.

