SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	POWER TRANSMISSION		
CODE NO. :	MCH141	**SEMESTER:**	TWO
PROGRAM:	MECHANICAL PROGRAMS		
AUTHOR:	HOWARD GRAY HOWARD.GRAY@SAULTCOLLEGE.CA		
DATE:	JAN 2011	**PREVIOUS OUTLINE DATED:**	JAN 2010
APPROVED:	*"Corey Meunier"* **CHAIR**		_____ **DATE**
TOTAL CREDITS:	3		
PREREQUISITE(S):	N/A		
HOURS/WEEK:	3		

For additional information, please contact Corey Meunier, Chair
School of Technology & Skilled Trades
(705) 759-2554, Ext. 2610

I. COURSE DESCRIPTION:

This course is designed to give the student the knowledge and practical exposure needed in dealing with various drive systems. The course will include Chain, Belt, and Gear drives. Discussions will include theory, design, maintenance and troubleshooting. Drives for these systems as well as accessories such as shafts, couplings and clutches will be discussed. The course includes written test and practical assignments in each topic area.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Explain and calculate Belt Drive Systems theory and practices.

Potential Elements of the Performance:

- Calculate Area of Contact
- Classify materials of belts and pulleys
- Calculate belt tension
- Calculate sheave and pulley speed and ratio's
- Explain the difference between Slip and Creep in belt drives

2. Identify Flat belt construction and their applications.

Potential Elements of the Performance:

- Identify flat belt materials
- Understand flat belt construction
- Describe the various Flat belt joining systems
- Classify flat belt applications

3. Identify V- belt construction and their applications.

Potential Elements of the Performance:

- Explain the advantages of using V-belts
- Understand V-belt construction
- Explain V-belt sizes, and codes
- Classify V- belt applications

4. Explore Belt Drive systems, assemblies and their applications.

Potential Elements of the Performance:

- Explain the difference between Pulleys and Sheaves
- Identify the components used in a drive system
- Assess drives and Pulleys for Flat belts

- Assess drives and Sheaves for V-belts
- Demonstrate the proper tension and alignment of pulleys and sheaves

5. Classify the various types of chain and sprockets used in Chain Drives.

Potential Elements of the Performance:

- Identify various links and construction
- Explain Chain sizes, and codes
- Describe components used in pin and roller Chain
- Identify various Sprocket styles and their applications

6. Explore Chain Drive systems, assemblies and their applications.

Potential Elements of the Performance:

- Identify the components used in a chain drive system
- Calculate sprocket ratio's and shaft speeds
- Select the correct size and style of chain to be used
- Demonstrate the proper tension and alignment of shafts and sprockets

7. Establish recognized Chain Drive maintenance procedures.

Potential Elements of the Performance:

- Select the correct Lubrication method for that chain
- Explain the need for Routine Maintenance inspections
- Demonstrate Basic Troubleshooting techniques
- Analyze chain drive failures.

8. Explore various types of materials, Gear types, and shaft arrangements used in Gear Drives.

Potential Elements of the Performance:

- Explain Gear tooth terminology
- Classify Gear Materials and their applications
- Identify the various Gear types and their applications
- Identify the different Shaft arrangements and the corresponding gear type.
- Calculate gear ratio's and shaft speeds for any given gear drive

9. Differentiate between Overdrive, Reduction, Worm and Planetary gear units

Potential Elements of the Performance:

- Describe Overdrive Units and their applications
- Describe Reduction Units and their applications
- Describe Worm Gear reduction Units and their applications
- Describe Planetary Gears and their applications

10. Establish Installation and maintenance procedures for gear drives assemblies.

Potential Elements of the Performance:

- Describe various installation and mounting styles
- Explain the various Lubrication systems
- Demonstrate motor to gearbox alignment
- Demonstrate gearbox to drive alignment
- Explain Basic Troubleshooting techniques

III. TOPICS:

1. BELT DRIVE THEORY
2. FLAT BELTS
3. V-BELTS
4. BELT DRIVE ASSEMBLIES
5. CHAIN DRIVE THEORY
6. CHAIN DRIVE ASSEMBLIES
7. CHAIN DRIVE MAINTENANCE
8. GEAR DRIVE DESIGN
9. OVERDRIVE AND REDUCTION UNITS
10. INSTALLATION / MAINTENANCE / TROUBLESHOOTING OF REDUCTION UNITS

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Millwright Manual/ Industrial Trades Pocket Manual/Safety Eye glasses and foot wear
Keyed safety lock.

V. EVALUATION PROCESS/GRADING SYSTEM:

Attendance *10% (12/15)* ***See special notes***
Assignments 30%
Tests 60%

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.