



COURSE OUTLINE: MCH141 - PWR TRANSMISSION SYS

Prepared: Howard Gray

Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	MCH141: POWER TRANSMISSION SYSTEMS
Program Number: Name	4039: MECH. ENG. TN-MANUFA 4040: MACHINE SHOP 5082: MECH.TECH.IND.MAINT.
Department:	MECHANICAL TECHNIQUES PS
Semesters/Terms:	20W, 20S
Course Description:	<p>A trades course designed to provide students with knowledge of power transmission systems such as belt drives, chains, gears, shafts and couplings.</p> <p>This course uses the Millwright Manual and Study Guide used in semester one.</p>
Total Credits:	3
Hours/Week:	3
Total Hours:	45
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course: Please refer to program web page for a complete listing of program outcomes where applicable.	<p>4039 - MECH. ENG. TN-MANUFA</p> <p>VLO 1 Complete all work in compliance with current legislation, standards, regulations and guidelines.</p> <p>VLO 2 Apply quality control and quality assurance procedures to meet organizational standards and requirements.</p> <p>VLO 3 Comply with current health and safety legislation, as well as organizational practices and procedures.</p> <p>VLO 4 Apply sustainability best practices in workplaces.</p> <p>VLO 5 Use current and emerging technologies to support the implementation of mechanical engineering projects.</p> <p>VLO 6 Analyze and solve mechanical problems by applying mathematics and fundamentals of mechanical engineering.</p> <p>VLO 7 Interpret, prepare and modify mechanical engineering drawings and other related technical documents.</p> <p>VLO 9 Manufacture, assemble, maintain and repair mechanical components according to required specifications.</p> <p>VLO 10 Verify the specifications of materials, processes and operations to support the design and production of mechanical components.</p> <p>VLO 12 Develop strategies for ongoing personal and professional development to enhance work performance.</p> <p>4040 - MACHINE SHOP</p> <p>VLO 1 Complete all work in compliance with current legislation, standards, regulations and</p>



SAULT COLLEGE | 443 NORTHERN AVENUE | SAULT STE. MARIE, ON P6B 4J3, CANADA | 705-759-2554

guidelines.

- VLO 2 Contribute to the application of quality control and quality assurance procedures to meet organizational standards and requirements.
- VLO 3 Comply with current health and safety legislation, as well as organizational practices and procedures.
- VLO 4 Support sustainability best practices in workplaces.
- VLO 5 Use current and emerging technologies to support the implementation of mechanical and manufacturing projects.
- VLO 6 Troubleshoot and solve standard mechanical problems by applying mathematics and fundamentals of mechanics.
- VLO 7 Contribute to the interpretation and preparation of mechanical drawings and other related technical documents.
- VLO 8 Perform routine technical measurements accurately using appropriate instruments and equipment.
- VLO 9 Assist in manufacturing, assembling, maintaining and repairing mechanical components according to required specifications.
- VLO 10 Select, use and maintain machinery, tools and equipment for the installation, manufacturing and repair of basic mechanical components.

5082 - MECH.TECH.IND.MAINT.

- VLO 1 Complete all work in compliance with current legislation, standards, regulations and guidelines.
- VLO 2 Contribute to the application of quality control and quality assurance procedures to meet organizational standards and requirements.
- VLO 3 Comply with current health and safety legislation, as well as organizational practices and procedures.
- VLO 4 Support sustainability best practices in workplaces.
- VLO 5 Use current and emerging technologies to support the implementation of mechanical and manufacturing projects.
- VLO 6 Troubleshoot and solve standard mechanical problems by applying mathematics and fundamentals of mechanics.
- VLO 7 Contribute to the interpretation and preparation of mechanical drawings and other related technical documents.
- VLO 8 Perform routine technical measurements accurately using appropriate instruments and equipment.
- VLO 9 Assist in manufacturing, assembling, maintaining and repairing mechanical components according to required specifications.
- VLO 10 Select, use and maintain machinery, tools and equipment for the installation, manufacturing and repair of basic mechanical components.

Essential Employability Skills (EES) addressed in this course:

- EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
- EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- EES 3 Execute mathematical operations accurately.
- EES 4 Apply a systematic approach to solve problems.
- EES 5 Use a variety of thinking skills to anticipate and solve problems.



SAULT COLLEGE | 443 NORTHERN AVENUE | SAULT STE. MARIE, ON P6B 4J3, CANADA | 705-759-2554

	<p>EES 6 Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.</p> <p>EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>EES 10 Manage the use of time and other resources to complete projects.</p> <p>EES 11 Take responsibility for ones own actions, decisions, and consequences.</p>														
Course Evaluation:	Passing Grade: 50%, D														
Other Course Evaluation & Assessment Requirements:	<p>Grade</p> <p>Definition Grade Point Equivalent</p> <p>A+ 90 - 100% 4.00</p> <p>A 80 - 89%</p> <p>B 70 - 79% 3.00</p> <p>C 60 - 69% 2.00</p> <p>D 50 - 59% 1.00</p> <p>F (Fail) 49% and below 0.00</p> <p>CR (Credit) Credit for diploma requirements has been awarded.</p> <p>S Satisfactory achievement in field /clinical placement or non-graded subject area.</p> <p>U Unsatisfactory achievement in field/clinical placement or non-graded subject area.</p> <p>X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.</p> <p>NR Grade not reported to Registrar's office.</p> <p>W Student has withdrawn from the course without academic penalty.</p>														
Books and Required Resources:	British Columbia Millwright manual by BC Ministry of Labour Publisher: Queens														
Course Outcomes and Learning Objectives:	<table border="1"> <tr> <td>Course Outcome 1</td><td>Learning Objectives for Course Outcome 1</td></tr> <tr> <td>1. Explain and calculate Belt Drive Systems theory and practices.</td><td> 1.1 Calculate Area of Contact 1.2 Classify materials of belts and pulleys 1.3 Calculate belt tension 1.4 Calculate sheave and pulley speed and ratio's 1.5 Explain the difference between Slip and Creep in belt drives </td></tr> <tr> <td>Course Outcome 2</td><td>Learning Objectives for Course Outcome 2</td></tr> <tr> <td>2. Identify Flat belt construction and their applications.</td><td> 2.1 Identify flat belt materials 2.2 Understand flat belt construction 2.3 Describe the various Flat belt joining systems 2.4 Classify flat belt applications </td></tr> <tr> <td>Course Outcome 3</td><td>Learning Objectives for Course Outcome 3</td></tr> <tr> <td>3. Identify V- belt construction and their applications.</td><td> 3.1 Explain the advantages of using V-belts 3.2 Understand V-belt construction 3.3 Explain V-belt sizes, and codes 3.4 Classify V- belt applications </td></tr> <tr> <td>Course Outcome 4</td><td>Learning Objectives for Course Outcome 4</td></tr> </table>	Course Outcome 1	Learning Objectives for Course Outcome 1	1. Explain and calculate Belt Drive Systems theory and practices.	1.1 Calculate Area of Contact 1.2 Classify materials of belts and pulleys 1.3 Calculate belt tension 1.4 Calculate sheave and pulley speed and ratio's 1.5 Explain the difference between Slip and Creep in belt drives	Course Outcome 2	Learning Objectives for Course Outcome 2	2. Identify Flat belt construction and their applications.	2.1 Identify flat belt materials 2.2 Understand flat belt construction 2.3 Describe the various Flat belt joining systems 2.4 Classify flat belt applications	Course Outcome 3	Learning Objectives for Course Outcome 3	3. Identify V- belt construction and their applications.	3.1 Explain the advantages of using V-belts 3.2 Understand V-belt construction 3.3 Explain V-belt sizes, and codes 3.4 Classify V- belt applications	Course Outcome 4	Learning Objectives for Course Outcome 4
Course Outcome 1	Learning Objectives for Course Outcome 1														
1. Explain and calculate Belt Drive Systems theory and practices.	1.1 Calculate Area of Contact 1.2 Classify materials of belts and pulleys 1.3 Calculate belt tension 1.4 Calculate sheave and pulley speed and ratio's 1.5 Explain the difference between Slip and Creep in belt drives														
Course Outcome 2	Learning Objectives for Course Outcome 2														
2. Identify Flat belt construction and their applications.	2.1 Identify flat belt materials 2.2 Understand flat belt construction 2.3 Describe the various Flat belt joining systems 2.4 Classify flat belt applications														
Course Outcome 3	Learning Objectives for Course Outcome 3														
3. Identify V- belt construction and their applications.	3.1 Explain the advantages of using V-belts 3.2 Understand V-belt construction 3.3 Explain V-belt sizes, and codes 3.4 Classify V- belt applications														
Course Outcome 4	Learning Objectives for Course Outcome 4														



4. Explore Belt Drive systems, assemblies and their applications.	4.1 Explain the difference between Pulleys and Sheaves 4.2 Identify the components used in a drive system 4.3 Assess drives and Pulleys for Flat belts 4.4 Assess drives and Sheaves for V-belts 4.5 Demonstrate the proper tension and alignment of pulleys and sheaves
Course Outcome 5	Learning Objectives for Course Outcome 5
5. Classify the various types of chain and sprockets used in Chain Drives.	5.1 Identify various links and construction 5.2 Explain Chain sizes, and codes 5.3 Describe components used in pin and roller Chain 5.4 Identify various Sprocket styles and their applications
Course Outcome 6	Learning Objectives for Course Outcome 6
6. Explore Chain Drive systems, assemblies and their applications.	6.1 Identify the components used in a chain drive system 6.2 Calculate sprocket ratio's and shaft speeds 6.3 Select the correct size and style of chain to be used 6.4 Demonstrate the proper tension and alignment of shafts and sprockets
Course Outcome 7	Learning Objectives for Course Outcome 7
7. Establish recognized Chain Drive maintenance procedures.	7.1 Select the correct Lubrication method for that chain 7.2 Explain the need for Routine Maintenance inspections 7.3 Demonstrate Basic Troubleshooting techniques 7.4 Analyze chain drive failures.
Course Outcome 8	Learning Objectives for Course Outcome 8
8. Explore various types of materials, Gear types, and shaft arrangements used in Gear Drives.	8.1 Explain Gear tooth terminology 8.2 Classify Gear Materials and their applications 8.3 Identify the various Gear types and their applications 8.4 Identify the different Shaft arrangements and the corresponding gear type. 8.5 Calculate gear ratio's and shaft speeds for any given gear drive
Course Outcome 9	Learning Objectives for Course Outcome 9
9. Differentiate between Overdrive, Reduction, Worm and Planetary gear units	9.1 Describe Overdrive Units and their applications 9.2 Describe Reduction Units and their applications 9.3 Describe Worm Gear reduction Units and their applications 9.4 Describe Planetary Gears and their applications
Course Outcome 10	Learning Objectives for Course Outcome 10
10. Establish Installation and maintenance procedures for gear drives assemblies.	10.1 Describe various installation and mounting styles 10.2 Explain the various Lubrication systems 10.3 Demonstrate motor to gearbox alignment 10.4 Demonstrate gearbox to drive alignment 10.5 Explain Basic Troubleshooting techniques
Course Outcome 11	Learning Objectives for Course Outcome 11
11. Classify the difference between various Couplings and Clutches	11.1 Describe the different alignment options 11.2 Explain the operating parameters and styles of Rigid couplings 11.3 Explain the operating parameters and styles of Flexible couplings 11.4 Explain the main function of both couplings and brakes



Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	40%
Tests	60%

Date:

August 27, 2019

Addendum:

Please refer to the course outline addendum on the Learning Management System for further information.

